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VOL. I.—36TH YEAR. SYDNEY, SATURDAY, JANUARY 22, 1949. No. 4.

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THE SECOND EXAMPLE OF ANTI-LEWIS SERUM FOUND IN AUSTRALIA.

By VERA I. KRIEGER[1] and R. T. SIMMONS,

From The Women's Hospital and the Commonwealth Serum Laboratories, Melbourne.

IN 1946 Mourant[(1)] reported a "new" human blood group antigen which occurred in 25% of the English population. The "new" agglutinogen, which was called the Lewis antigen, was shown to be independent serologically of the ABO, MN, Rh, P and Lutheran systems. Limited family studies showed that the agglutinogen is inherited, and the evidence so far obtained suggests that it is a dominant Mendelian character.

The Lewis antigen was discovered in the investigation of serum from two women whose babies were suspected of suffering from hæmolytic disease of the newborn, and the atypical agglutinin in both sera was identical. No definite evidence was found in either case that the agglutinin concerned was the result of immunization of the mother by the fœtus. In one case the red cells of the jaundiced baby were not agglutinated by its mother's serum, and from this it was suggested that the agglutinin was of the spontaneous rather than of the immune type.

In each case the antibodies were active at 37° C., but gave slightly stronger reactions at room temperature.

Jakobowicz, Simmons and Bryce[(2)] reported a further example of the Lewis antibody found in the serum obtained from a patient (Mrs. M.P.) who had had a transfusion reaction. This patient was admitted to hospital with an atypical macrocytic anæmia thought to be associated with intestinal malignant disease. She received one blood transfusion after admission to hospital and no reaction was observed. Some weeks later she was given a second transfusion, which was followed by a severe hæmolytic reaction. The patient had had five children, all living, the youngest aged twenty-five years. No history could be obtained of manifestations in the children suggestive of iso-immunization in the mother's pregnancies. The patient was of Group O Rh_1Rh_1 (CDe/CDe), and donors used were of Group O Rh_1Rh_2 (CDe/cDE) and Group O Rh_1rh (CDe/cde). Both donors' red cells were found to contain the Lewis antigen, as did those of one of three of the patient's children who were available for testing.

The investigation of this case (Mrs. M.P.) in the initial stages was rendered difficult because the patient's serum also contained weak agglutinating anti-Hr′ (anti-c) and incomplete or blocking anti-Hr′ antibodies. The presence of both anti-Lewis and anti-Hr′ antibodies was confirmed in Dr. Mourant's laboratory, and the Lewis antibody from Mrs. M.P. gave reactions identical with those of the two examples of anti-Lewis serum found by Mourant. Mrs. M.P.'s serum gave strong anti-Lewis reactions on slides in five minutes at room temperature, but weaker reactions at 37° C. In this case it seems most likely that the antibodies were produced as the result of immunization by blood transfusion, particularly as no reaction followed the first transfusion with blood containing the Lewis antigen.

An unusual antibody, which has been referred to in another paper,[(3)] was found in the serum of a patient at the Women's Hospital. The investigations described in the present paper show this to be the second example of the Lewis type of antiserum to be found in Australia.

The Anti-Lewis Serum Produced by Miss L.-E.

This patient, a single woman of forty-five years, had had persistent vaginal hæmorrhage for six months and was admitted to the Women's Hospital. She was found to be suffering from a carcinoma of the cervix. The patient's blood was of Group O, type Rh_1, and because of the low concentration of hæmoglobin in her blood was given two pints of apparently compatible Group O blood on the same day. No reaction was observed. Four weeks later a second transfusion of Group O blood was commenced and she developed a severe reaction with vomiting, severe rigor and

[1] This work, performed by one of us (V.I.K.), was made possible by a grant from the National Health and Medical Research Council of Australia.

anuria after 200 millilitres of this blood had been given. A sample of the patient's blood was taken soon after the transfusion reaction and the washed red cells gave a reaction to the Coombs test.[3] This was a rather remarkable result because Mourant (*loco citato*) could not obtain agglutination when Lewis-positive cells treated with a barely agglutinating dose of Lewis antibody were washed and then tested with the Coombs reagent. In the present case the proportion of donor's cells in the patient's blood must have been relatively small, since only 200 millilitres of blood had been given. Even if they had adsorbed the maximum amount of antibody the detection of the sensitization by Coombs's test is difficult to explain in view of the small number of donor cells which could have been present.

A further series of tests were carried out on a sample of Miss L.-E.'s serum obtained some days later, and the most significant results are as follows.

Twenty Group O cells of known Rh and MN types were tested with Mrs. M.P.'s (anti-Lewis) serum and with Miss L.-E.'s serum, on slides at room temperature and at 37° C. The same five samples of cells were agglutinated by both sera and the same fifteen samples were not agglutinated. The reactions obtained were stronger at room temperature than at 37° C.

Some time later, through the courtesy of Dr. A. E. Mourant, it was possible to test Miss L.-E.'s serum and Mrs. M.P.'s serum in parallel with four anti-Lewis sera provided by him. Almost identical reactions with a large number of Group O cells were obtained with all six antisera. The reactions in all cases were stronger at room temperature (20° C.) than at 37° C. and Mrs. M.P.'s antiserum gave by far the strongest reactions.

The two donors whose blood was given in the first transfusion have since been tested and the blood of one was found to contain the Lewis antigen whilst that of the other did not. Although it was not possible to test the blood of the donor used in the second transfusion for the Lewis factor, it can reasonably be assumed that he had the Lewis antigen in his blood and that the transfusion of his blood caused the reaction in the patient who had become immunized to this factor as the result of the first transfusion.

Subsequent tests on samples of the patient's serum during a period of eight months following the transfusion reaction revealed a progressive deterioration in the titre of the Lewis antibody to scarcely detectable levels.

Summary.

An antiserum (L-E) produced in a single woman, probably as the result of immunization by blood transfusions in 1946, has been shown to have the specificity of anti-Lewis serum described by Mourant in the same year. This is the second example of its kind found in Australia. The reactions given by the two Australian anti-Lewis sera have been shown to be identical with those given by four anti-Lewis sera found in England by Dr. Mourant. The agglutination reactions are stronger at room temperature (20° C.) than at 37° C.

The Lewis antigen occurs, according to Mourant, in about 25% of people of British stock. In our series of tests with the "L-E" serum a similar distribution was found.

Acknowledgement.

We wish to express our gratitude to Dr. Rachel Jakobowicz (Blood Transfusion Service, Melbourne) for her cooperation in the testing of this serum.

References.

[1] A. E. Mourant: "A New Human Blood Group Antigen of Frequent Occurrence", *Nature*, Volume CLVIII, 1946, page 237.

[2] Rachel Jakobowicz, R. T. Simmons and Lucy M. Bryce: "Notes on a Serum Containing Anti-Lewis and Anti-c (Anti-Hr') Antibodies", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1947, page 570.

[3] Rachel Jakobowicz, Vera I. Krieger and R. T. Simmons: "The Value of the Coombs Test in Detection of Iso-Sensitization of the Newborn", THE MEDICAL JOURNAL OF AUSTRALIA, August 7, 1948, page 143.

Addendum.

(By R.T.S.)

Since this paper was submitted for publication, P. H. Andresen (*Acta pathologica et microbiologica Scandinavica*, Volume XXIV, 1948, page 616) has reported that he and Dr. E. Friesleben, working independently in Copenhagen, have found an anti-L agglutinin in no less than eight mothers. The receptor corresponding to the agglutinin was found in the blood of 21% of adults examined, but occurred in up to 70% of children tested according to age.

In a personal communication to me, Dr. A. E. Mourant, of the Ministry of Health Blood Group Reference Laboratory, London, advised that he has now adopted the anti-L nomenclature instead of anti-Lewis. Further, that anti-L only agglutinates blood of genotype *LL* in adults, but it agglutinates *LL* and *Ll* types in babies. Dr. Andresen has lately found an anti-l serum which has most unusual characteristics. This "new" complex blood system is now being worked out by Dr. Andresen, of Copenhagen, and Dr. R. Race, of London.

PATHOLOGICAL FINDINGS IN SOME DEATHS DURING ANÆSTHESIA.

By KEITH BOWDEN, M.S.,
Lecturer in Forensic Medicine in the University of Melbourne.

THE object of this paper is to set out the pathological findings in 50 cases of death during anæsthesia.

In Melbourne during the year 1947 there were 23 deaths during anæsthesia, either on the table, before the operation was commenced or completed, or in the post-operative period before the patient had recovered from the anæsthetic. This number of deaths, for the year, was a little in excess of the usual, but this was within normal fluctuation.

The *Registration of Births, Deaths and Marriages Act*, 1938, imposes a legal obligation on the anæsthetist or the surgeon to report deaths during anæsthesia (including the recovery phase) to the Coroner. Subsection (C) of this Act says that in all cases of sudden unexpected death or when it has come to the knowledge of the medical practitioner that the death has occurred from unnatural causes or under any circumstances of suspicion, or when the medical practitioner is unable to certify to the cause of death, he shall report the case to the Coroner. In the event of failure to comply with this section, he is liable to a penalty of not more than five pounds. Failure to notify such a death may render the practitioner liable for obstructing the Coroner in his duty, and the practitioner may possibly be punished under the old law relating to coroners.

The Coroner usually orders an independent pathologist to carry out an autopsy in these cases. This practice has obvious advantages and disadvantages. It is preferable from the Coroner's viewpoint that the post-mortem examination should be made by an independent pathologist, both in the case of public hospital deaths and deaths occurring in private practice; but it has the disadvantage that it is sometimes difficult to get full cooperation between the pathologist, the surgeon, the anæsthetist and any others concerned.

Any post-mortem examination conducted in a case of death under anæsthesia should be preceded by a thorough discussion of the known facts between the parties concerned and the pathologist carrying out the autopsy. So many factors may enter into the cause of the death that the pathologist conducting the examination is deprived of much essential data in finding why death occurred, if he is not able to make use of all the clinical information about the case when planning his investigation. Even so, nothing may be found at the autopsy adequately to account for the death. There may have been difficulties in management of the patient, such as laryngeal spasm, respiratory obstruction during the administration of the anæsthetic, poor oxygenation and so on, a series of

factors that, in summation, may have a very serious and even fatal outcome when the heart of the patient is diseased. Statements which are made by the anæsthetist and the surgeon which are to be read at a subsequent inquest, if one is held, are often very guarded, and do not always supply the detail necessary for the conduct of an intelligently directed autopsy. In a recent case, autopsy showed that the patient had been asphyxiated, but no cause for it could be found. In a consultation the anæsthetist stated that anæsthesia of the patient, who was a poor "risk", had been induced with 0·5 gramme of "Pentothal" and 10 milligrammes of "Tubarine". A soft-cuffed intratracheal tube was inserted and connected to a gas machine; it was intended to continue the anæsthetic with cyclopropane. At this stage the patient became quite blue and respiration ceased. No oxygen could be forced down the intratracheal tube for several reasons: the machine was faulty and there was a leak between the bag of oxygen and the patient, and in addition the patient had a laryngeal spasm and the intratracheal tube was old and soft. This case is cited to illustrate the fact that in the absence of this information no cause for the asphyxia could be assigned by the pathologist.

The Coroner, acting on the post-mortem report submitted to him by the pathologist, may or may not order an inquest in any case of death under anæsthesia.

In those cases in which the patient is desperately ill and practically *in extremis*, when operation offers the only chance of recovery, and when operation and the anæsthetic have had virtually nothing to do with the death, inquests are as a rule not held. This depends upon the discretionary power of the Coroner, but coroners come and go, and they do not all have the same outlook. Recently in Melbourne when a death occurred under spinal analgesia (Case 40) and no inquest was held, trouble subsequently arose with the relatives. The husband of the deceased, three months after the death, wrote to the Crown Law Department and asked why an inquest was not held, as he was anxious to know the full circumstances and why his wife died. This is one aspect that may be forgotten by those who say that coronial inquests in anæsthetic deaths are of little value, and is also one good reason why post-mortem examinations in these cases are best conducted independently of the hospital concerned.

In some cases it is desirable, as much in the interests of the community as in that of the medical profession, that the death should be thoroughly investigated.

It is true that coronial inquests are frequently of little value scientifically in relation to these deaths, but this objection could well be met by an independent inquiry by a group of medical men seriously interested in the scientific side of this subject, which could sift all the available evidence in an attempt to determine how a similar preventible death could be avoided in the future.

Analysis of 50 Deaths Under Anæsthesia.

In Table I 51 cases of death under anæsthesia have been analysed, and the relevant facts, as far as they could be gathered, are set out in each case. They are unselected cases and comprise, as nearly as possible, a straight series of the last fifty cases that have occurred in Melbourne. As much detail as possible has been included to try to make the cases self explanatory, but in many of them no details about resuscitative procedure were supplied.

No figures or percentages are mentioned, because they would be largely meaningless. It was not found possible, for example, to ascertain how many anæsthetics were administered in the area coming under the jurisdiction of the Melbourne Coroner for any one year, so that any statement about percentage deaths would be only guess work.

The accompanying group of cases serves chiefly to emphasize that insufficient regard for the well-established principles in administration of anæsthetics sometimes leads to disaster. In many of these cases the deaths are frankly preventible, others are obviously unpreventible.

Resuscitation.

In many of these cases no detailed mention was made of the measures used in resuscitation apart from the statement that despite all restorative measures the patient failed to respond. In general a standard procedure was adopted, namely, clearing the mouth and pharynx, artificial respiration, administration of oxygen, and the injection of one or more stimulant drugs. Oxygen was generally introduced into the pharynx by a catheter, directly through an intratracheal tube in Case 29. The drugs used were mostly "Coramine" and adrenaline, less commonly "Anacardone", ephedrine and "Neo-Synephrine" were used. Cardiac massage was performed in Cases 33, 40 and 49. In Case 9 tracheotomy was performed, but the obstruction by vomitus was below this level.

Discussion.

From a consideration of these cases we may say that death resulted from one of the following: (*a*) Natural disease for which the operation was designed and the anæsthetic given. (*b*) Natural disease present apart from the disease for which the operation was undertaken. (*c*) Death directly due to the anæsthetic. (*d*) Death due to operative procedure, shock, hæmorrhage *et cetera*. (*e*) Death due to complication of the anæsthetic, such as inhalation of vomitus *et cetera*.

When death is due to the anæsthetic, it may have resulted from bad choice, overdosage, too prolonged anæsthesia or continuance of the administration of the anæsthetic despite danger signs of impending collapse. Some of the deaths cannot be related to any one specific factor, a number of factors playing a part. Again it is not always possible to decide the cause of death, and the more the anæsthetic itself is responsible for the death, in general, the less there is to find at autopsy.

Much information of practical value emerges from a study of these cases. Some of the outstanding facts cannot have too much emphasis. There is always danger unless the stomach is empty. The time-honoured practice of waiting until four hours have elapsed since the last meal and then giving an anæsthetic, under the impression that the stomach will be empty, has led to many fatalities.

When injury results, or shock, the emptying time of the stomach may be greatly delayed, and the stomach may be full of partly digested food many hours after an accident. The longest case in this series (Case 8) was that of a woman who sustained a fractured left tibia and fibula and a ruptured bladder. She was given no solid food and was operated on twenty-eight hours after the accident and died from asphyxia from inhaled vomitus. Autopsy showed that the stomach still contained much partly digested semi-solid food. In the case of the boy with the fractured forearms (Case 7), the stomach was still more than half full of semi-solid food nine hours after the last meal. These cases may be exceptional, but they serve to emphasize the fact that the stomach cannot be relied upon to be empty four hours after the last meal, particularly in cases of accident, fear or shock, when the emptying time may be considerably prolonged. These deaths occur year after year with monotonous regularity and most of them are frankly preventible.

When asphyxia has been assigned as the cause of death typical asphyxial signs were found at the post-mortem examination—dark fluid blood, congestion of the organs, showers of petechial hæmorrhages on the surfaces of the lungs and heart and often petechiæ elsewhere—and there was an obvious cause for the asphyxia. In an asphyxial death, it must not be forgotten that vomiting is often a result of the asphyxia; the presence of vomitus does not necessarily mean it preceded the asphyxia.

Asphyxia resulted in Cases 3, 6 and 10 from aspiration of blood into the trachea and bronchi. The vital capacity of the boy in Case 6 was already greatly reduced by extensive pulmonary tuberculosis. In Cases 3 and 10 a Davis gag was used. It was thought by the anæsthetist in Case 3, where anæsthesia was not deep, that death was due to sudden cardiac failure and that the blood found *post mortem* had entered the trachea and bronchi as a result of the artificial respiration performed to resuscitate the girl when natural breathing ceased. This girl showed typical asphyxial signs at autopsy; if the blood did enter the bronchi as a result of artificial respira-

TABLE I.

Number.	Sex.	Age. (Years.)	Operation.	Anæsthetic.	Duration.	Cause of Death.	Associated Pathology.	Remarks.
1	F.	9	Tonsillectomy.	1/150 grain atropine 20 min. before E.C. 4 ml. and O.E. 2 oz.	Induction stage 5 min.	Typical asphyxia. Excessive mucus and froth in air passages.	Nil.	Excessive froth and mucus during induction. Pharynx cleared with sucker. Respiration failed first, pulse felt distinctly after cessation of respiration.
2	M.	60	Cordotomy for intractable pain.	Nitrous oxide and oxygen.	2½ hours.	Typical asphyxia from vomitus obstructing airway.	Carcinoma of bladder. Metastases in abdominal wall. Enlarged heart.	Food and fluid in stomach vomited and inhaled at completion of operation. Oxygen only being administered when he vomited.
3	F.	15	Tonsillectomy.	Ether 6 oz., Davis gag.	65 min.	Typical asphyxia. Blood in trachea and bronchi.	Very slight dilatation of left ventricle.	——
4	F.	18	Dental extractions.	E.C. 6 ml., ether 20 ml.	10 min.	Typical asphyxia. Vomitus in air passages.	Nil.	Stomach contained several ounces of rather greenish, grumous material; same as in air passages.
5	F.	4½	Reduction of fractured forearms.	E.C. and O.E.	30 min.	Typical asphyxia. Vomitus in air passages.	Nil.	Last meal 1 p.m. Accident 4.30 p.m. Anæsthetic 6.30–7 p.m. Vomited 8.15 p.m. when apparently out of anæsthesia. Death pronounced 10 p.m. Stomach contained a good deal of undigested food.
6	M.	16	Dental extractions.	E.C. 12 ml.	Minutes.	Typical asphyxia. Blood in air passages.	Extensive fibrocaseous pulmonary tuberculosis.	Stopped breathing at one stage, with artificial respiration started breathing again. Subsequent cessation of respiration.
7	M.	13	Reduction of fractured forearms.	E.C. and O.E.	10 min.	Typical asphyxia from vomitus in air passages.	Nil.	Stomach full of partly digested semi-solid food nine hours after accident.
8	F.	55	Ruptured bladder (laparotomy).	Ether.	Anæsthetic in induction stage.	Typical asphyxia. Vomitus in air passages.	Dilated heart. Narrowed coronary orifices. Fractured left tibia and fibula.	Stomach nearly full of partly digested food 28 hours after accident.
9	M.	17	Repair of lacerated hand.	"Pentothal" 0·5 gramme, then O.E. 30 oz.	3½ hours.	Typical asphyxia. Inhaled vomitus.	Nil.	Stomach two-thirds full of partly digested food. Vomited half an hour after operation completed. Usual methods of resuscitation, including tracheotomy.
10	M.	4 years 10 mths.	Tonsillectomy.	E.C. and O.E. (Davis gag).	35 min.	Typical asphyxia. Blood clot and mucus wedged at bifurcation of trachea.	——	Left tonsil dissected out. Colour not good at that stage.
11	F.	10 mths.	Convulsions.	O.E.	Few min.	Typical asphyxia. Convulsions *plus* anæsthetic.	Bronchopneumonia.	——
12	F.	13 mths.	Intestinal obstruction.	O.E. 2 oz. and oxygen continuous.	1 hour.	Typical asphyxia. Vomitus in air passages.	Intussusception.	Obstruction 30 hours' duration. A very grave risk.
13	M.	22	Tonsillectomy.	E.C. 17 drops, O.E. 2½ oz., morphine grain 1/6, atropine grain 1/150.	Few min.	Typical asphyxia. Laryngeal spasm.	Nil.	——
14	M.	41	Mangled hand.	Carbogen and O.E. 28 oz.	1 hour.	Typical asphyxia. Vomitus in air passages.	Nil.	Condition good. Operation completed. Died one hour later in ward after regurgitation of stomach contents, which were inhaled into bronchi.
15	M.	65	Tracheotomy.	E.C. and O.E.	Induction stage.	Laryngeal obstruction from natural disease.	Carcinoma of œsophagus. Laryngeal obstruction. Coronary sclerosis.	*In extremis.* Death before tracheotomy started.
16	F.	56	Closure of fæcal fistula.	E.C. 5 ml., ether 2–3 oz. Oxford vaporizer.	15 min.	Natural disease.	Pancreatitis. Peritonitis. Pulmonary embolus. Basal collapse of lungs.	The pulmonary embolus followed the first operation and was present when this operation began.

E.C. = ethyl chloride. O.E. = open ether.
Note.—The assessment of risk in the "remarks" column is the pre-operative assessment of the patient that was made before the anæsthetic was given.

TABLE I.—*Continued.*

Number.	Sex.	Age. (Years.)	Operation.	Anæsthetic.	Duration.	Cause of Death.	Associated Pathology.	Remarks.

TABLE I.—*Continued.*

Number.	Sex.	Age. (Years.)	Operation.	Anæsthetic.	Duration.	Cause of Death.	Associated Pathology.	Remarks.
17	F.	58	Repair of common bile duct.	Carbogen and O.E.	2½ hours.	Hæmorrhage. Operative shock.	Jaundice. Onstructed common bile duct. Narrowed right coronary orifice.	——
18	F.	50	Laparotomy for internal hæmorrhage.	O.E. 1½ oz.	5 min.	Hæmorrhage.	Hæmorrhagic tumour of liver. Enlarged left ventricle.	——
19	M.	9 wks.	Intestinal obstruction.	O.E. 1½ oz. and oxygen.	1 hour.	Natural disease.	Volvulus of small intestine. bronchopneumonia.	A very grave risk. *In extremis* before operation commenced.
20	M.	82	Control of bleeding from previous surgical incision near armpit.	O.E.	10 min.	Rupture of aortic arch.	Severe atherosclerosis and degenerative changes.	——
21	F.	31	Cæsarean section.	E.C. 2 ml., ether 8½ oz.	80 min.	Natural disease *plus* operative shock *plus* anæsthetic.	Disproportion. Uterine inertia. Subacute nephritis. Fatty liver.	——
22	M.	55	Suprapubic cystostomy.	E.C. 4 ml., O.E.	10 min.	Sudden failure of dilated heart. Severe coronary atheroma.	Neurosyphilis. Hypertension 240/110. Overflow incontinence right hydroureter and hydronephrosis.	——
23	M.	58	Dental extractions for pyorrhœa.	E.C. and ether 5 oz.	——	Dilated heart. Degenerative changes in myocardium.	Chronic alcoholic. Obesity. Cholelithiasis. Double hydronephrosis of moderate degree.	A confirmed alcoholic.
24	F.	67	Removal of cervical gland for biopsy.	E.C. 4 ml., ether 8 oz.	1½ hours.	Myocardial failure from slightly dilated heart *plus* anæsthetic.	? Hodgkin's disease. Cardiac muscle thin and friable.	Condition good.
25	M.	33	Exploration and drainage of empyema.	E.C. and ether 16–20 oz.	½ hour.	Natural disease.	Bilateral bronchiectasis. Left-sided empyema; abscesses in lower left lobe.	Condition poor at commencement. Local anæsthesia not used because of infection in chest wall.
26	F.	23 mths.	Cerebellar tumour. Evacuation of cyst.	Intratracheal ether.	2 hours.	Failure of medullary centres.	Cerebellar tumour.	General condition fair at outset. On evacuation of cyst respiration slowed and pulse deteriorated.
27	M.	77	? Strangulated femoral hernia.	E.C. 5 ml., ether 3 oz.	Induction on stage.	Myocardial failure. Dilated decompensated heart.	Heart enlarged. Fibroid myocarditis.	——
28	M.	67	Smith-Petersen nail for fractured neck of femur.	E.C. 2 ml., O.E. 8 oz.	50 min.	Myocardial failure. Dilatation of heart.	Fibroid myocarditis.	——
29	F.	40	Cæsarean section.	Ether and oxygen 4 oz.	35 min.	Acute pulmonary œdema.	Considerably enlarged heart with œdema, ascites, pleural effusions. Chronic nephritis. Pre-eclampsia.	Sudden development of acute pulmonary œdema on delivery of child and release of abdominal pressure.
30	F.	39	Ruptured uterus. Hysterectomy.	Carbogen and O.E.	55 min.	Hæmorrhage and operative shock.	Chronic nephritis. Dilated heart. ruptured uterus. Hæmorrhage.	Condition not very satisfactory.
31	F.	52	Plaster and removal of nails, following previous arthrodesis of knee.	O.E. 8 oz.	28 min.	Pulmonary embolus following previous operation.	Clot in main pulmonary vessels and its branches. This followed on first operation of arthrodesis.	——
32	M.	78	Intestinal obstruction.	Oxygen, ether 2½ oz.	25 min.	Myocardial failure from enlarged heart and coronary sclerosis.	Carcinoma of colon. Intestinal obstruction. Severe coronary atheroma.	Condition very grave.
33	F.	46	Hysterectomy.	O.E. 12 oz.	45 min.	Operative shock.	Very large fibroid uterus. Mongolism.	——
34	—	54	Drainage of ? extradural abscess.	Intratracheal ether.	30 min.	Natural disease.	Meningitis (acute).	Condition desperate.
35	F.	36	Thyreoidectomy.	Ether induction, intratracheal ether 8 oz.	1¾ hours.	Bilateral collapse of lungs. Almost simultaneous cessation of respiration and pulse. Ruptured apical bleb.	Adenomatous toxic thyreoid. Symmetrical collapse of lungs.	No displacement of or air in mediastinum. Laryngeal spasm and sudden rapid rise in pulse when patient moved from trolley on to operating table and cyanosis. Intermittent cyanosis during operation.

E.C.=ethyl chloride. O.E.=open ether.
Note.—The assessment of risk in the "remarks" column is the pre-operative assessment of the patient that was made before the anæsthetic was given.

TABLE I.—*Continued.*

Number.	Sex.	Age. (Years.)	Operation.	Anæsthetic.	Duration.	Cause of Death.	Associated Pathology.	Remarks.
36	F.	46	Ruptured diaphragm. Herniation of intestine into left pleural sac.	Spinal 2 ml., "Nupercaine" 1 : 200 with 6% glucose. Nitrous oxide and oxygen. Trendelenburg position (15°).	20 min.	Sudden sucking pneumothorax on reduction of hernia through left dome of diaphragm. Mediastinal shift and cardiac embarrassment.	Collapsed left lung. Fractured pelvis. Fractured left lumbar transverse processes.	Condition fair at commencement of operation. Sudden collapse on entry of air into pleural cavity with sudden heart failure.
37	M.	56	Laparotomy.	High spinal 6 ml., "Percaine" (1 : 1500).	20 min.	Natural disease.	Leakage from duodenal suture line. Subphrenic abscess. General peritonitis. Dilated heart. Pancreatitis. Bronchopneumonia.	First operation seven days previously. A bad risk.
38	M.	74	Prostatectomy.	Spinal 12 ml., "Nupercaine" (1 : 1500), morphine grain 1/6, hyoscine grain 1/150. Lying on side, then for 12 min. supine.	65 min.	Anæsthetic *plus* operative shock.	Blood pressure 155/95. Acute retention for three days. Moderate hydronephrosis. Moderate enlargement of heart.	A good risk. Pulse became weak when patient turned on to his back. Heart gradually failed. Heart stopped before respiration.
39	M.	55	Laparotomy. ? Obstruction.	Spinal: 2 ml. "Nupercaine" (1 : 200) without glucose. Lying on side, turned into Trendelenburg position (15°).	20 min.	Sudden almost simultaneous respiration and cardiac failure due to natural disease *plus* anæsthetic.	Widespread purpura, abdominal, cutaneous *et cetera*.	Purpura simulating intestinal obstruction. Condition good before operation.
40	F.	53	Cholecystectomy.	Spinal: "Nupercaine" (1 : 200) without glucose diluted to 10 ml. with cerebro-spinal fluid, sitting up, then Trendelenburg position (15°).	40 min.	Respiratory failure which preceded cardiac failure. Heart felt beating through diaphragm after respiratory centre failed.	Dark fluid blood. Heart relaxed.	Good risk.
41	F.	21	Curette for incomplete abortion.	20 drops chloroform, followed by E.C. 10 ml., followed by chloroform dr. 2, morphine gr. 1/6, atropine gr. 1/150.	20 mins.	Respiratory *plus* cardiac arrest. Ethyl chloride *plus* chloroform overdose.	Some small cysts, probably congenital, at right lung apex producing cough.	Patient struggled and was most uncooperative in chloroform induction, so change made to E.C. Adrenaline (1 : 1000) 1 ml. intracardiac *plus* "Coramine" *plus* artificial respiration.
42	F.	52	Reduction of fractured right femur.	"Pentothal" 5% solution. 3 ml. rapidly, 1¼ ml. in next 5 min., 4 ml. in next 15 min.	20 min.	Dilated heart. Coronary atheroma. Soft atrophic myocardium *plus* anæsthetic.	Cholelithiasis. Uterine fibroids.	A good risk.
43	M.	73	Suprapubic cystostomy.	"Pentothal" 4 g., morphine gr. 1/6, atropine gr. 1/100. Rapidly given.	Operation not commenced.	Enlarged heart. Coronary atheroma. Calcified aortic valves *plus* anæsthetic.	Enlarged prostate. Bladder neck obstruction. Moderate hydronephrosis.	Only a fair risk. "Pentothal" rapidly administered. Usual methods of resuscitation. Cardiac massage.
44	M.	54	Epithelioma of lip. Implantation of radon.	"Pentothal" g. ½ not sufficient to anæsthetize patient, followed by a further ½ g.	10 min.	Respiratory failure, then myocardial failure from cardiac dilatation. Soft fatty myocardium *plus* anæsthetic.	Delusional insanity. A small aorta.	Shallow breathing following the administration of the second dose of "Pentothal".
45	M.	53	Rib resection and drainage.	Local anæsthesia *plus* "Pentothal" 0·9 g. given in 5 min.	30 min.	Dilated heart. Thrombosis in left main coronary vessel.	Empyema. Collapsed lung.	——
46	F.	36	Artificial right-sided pneumothorax (refill).	Local: "Planocaine" (2%) 1·5 ml.	15 min.	Anoxia from reduction of vital capacity.	Left lung almost totally destroyed by pulmonary tuberculosis. Fibro-caseous tubercle with cavitation in right lung, upper and lower lobes.	Condition fair. Artificial pneumothorax six months' duration. Previous refills of 350–500 ml. At commencement of this refill right lung half collapsed. Patient restless during refill and uncomfortable in chest; became cyanosed at 300 ml. one min. later generalized convulsion, intense cyanosis, death.
47	M.	64	Partial gastrectomy for peptic ulcer.	Local infiltration abdominal wall.	1 hour.	Natural disease.	Carcinoma of prostate. Metastases in trachea and lungs. Ulcerative endocarditis. Hæmorrhage into remainder of stomach at operation.	Massive transfusions before operation — continuous transfusion during operation. A very grave risk.

E.C. = ethyl chloride. O.E. = open ether.
Note.—The assessment of risk in the "remarks" column is the pre-operative assessment of the patient that was made before the anæsthetic was given.

TABLE I.—*Continued.*

TABLE I.—*Continued.*

Number.	Sex.	Age. (Years.)	Operation.	Anæsthetic.	Duration.	Cause of Death.	Associated Pathology.	Remarks.
48	F.	38	Posterior decompression of brain.	30 ml. "Novocain" (2%).	1 hour.	Asphyxia from cerebral compression.	Cerebellar and frontal lobe tuberculomata. Right apical tuberculosis.	——
49	M.	48	Pneumonectomy for carcinoma of left lung.	"Omnopon" gr. 1/3, scopolamine gr. 1/150, "Tubarine" 15 mgm., "Pentothal" 0·6 g., cyclopropane and oxygen; 45 min. later "Tubarine" 5 mgm.; 45 min. later "Tubarine" 5 mgm.	3 hours.	Respiratory failure.	Metastases in mediastinal glands. Cholelithiasis. Fluid dark blood throughout the body.	Death occurred five hours after commencement of anæsthesia from respiratory failure. There were periods of post-operative apnœa; oxygen was given through an intratracheal tube under pressure. Three injections of "Prostigmine" were given altogether from the commencement of operation. The patient was not capable of maintaining spontaneous respiration at an adequate level two hours after operation completed. Only a fair risk.
50	M.	65	Curetting of left mastoid.	Nitrous oxide and oxygen.	15 min.	Natural disease.	*Otitis media.* Mastoiditis. Lateral sinus thrombosis. Pulmonary abscesses. Septicæmia.	——
51	M.	59	Removal of glands in neck.	"Pentothal", curare followed by endotracheal cyclopropane.	70 min.	Laryngeal and pharyngeal œdema.	Hemorrhage in vallecula and around glottis.	Death occurred two hours after operation completed. The acute œdema was associated with the passage of the endotracheal tube.

E.C. = ethyl chloride. O.E. = open ether.

Note.—The assessment of risk in the "remarks" column is the pre-operative assessment of the patient that was made before the anæsthetic was given.

tion, then what asphyxiated her? No other cause was found for the asphyxia. With the usual position adopted for tonsillectomy, with a pillow or sandbag under the shoulders and the head dependent, gravity would be acting against the entry of the blood after natural respiration ceased, and in any case any blood about the pharynx should be sucked or swabbed away.

Blood and fluid vomitus can gain entry into the trachea and bronchi as a result of artificial respiration. This can be demonstrated after death in the autopsy room. If fluid blood is placed in the mouth and pharynx and artificial respiration performed for a few minutes before the onset of rigor, the blood will readily disappear down the trachea and into the bronchi. This is important and means that, when respiration ceases during operations performed about the nose and mouth, every effort is necessary to swab or suck out the pharynx lest blood should be drawn into the bronchial tree and impede the chances of recovery. This is also of great importance when vomiting has occurred. Artificial respiration may result in the forcing of the contents out of the stomach up the œsophagus into the pharynx and mouth, and unless the contents are sucked or swabbed clear they may gain entrance into the bronchial tree as a result of artificial respiration. When vomiting has occurred or when there is any possibility of blood in the pharynx, artificial respiration may defeat its purpose unless the pharynx is thoroughly cleared.

One fact that needs emphasis is that, although the patient's colour does not become blue, the patient may nevertheless be suffering from definite oxygen lack, and asphyxia can and does occur in the absence of frank cyanosis. Surprise was occasioned in some of these deaths, because the patient did not first become frankly cyanosed when death was due to asphyxia although it had been thought that death was due to cardiac failure. Recently one anæsthetist, in a personal communication, stated that a child to whom he was giving an anæsthetic vomited, and shortly afterwards respiration ceased. The child did not become cyanosed, and it was only when the anæsthetist put his finger down into the child's throat and removed a piece of partly digested meat that respiration recommenced. An anæsthetized patient may appear to be reasonably oxygenated, while actually suffering from oxygen lack. Forceful inspiratory and expiratory movements of the chest may be taking place in the absence of an adequate airway.

Death from asphyxia may be imminent, the patient's colour may belie this and, as a result, insufficient attention may be given to the respiratory system in the attempt to resuscitate the patient. The treatment is misdirected to the heart instead of to the respiratory passages. In a recent case, a man was being reanæsthetized to control bleeding after a tonsillectomy. Respiration ceased during the reinduction stage. Although the patient's red blood cell count was 5,000,000 per cubic millimetre before reanæsthetization, cyanosis did not develop—the patient was an ashen-grey colour—and because of this it was thought that his bronchial tree could not be obstructed and that he was probably suffering from a cardiac collapse. An attempt was made to intubate his trachea, but it could not be done under the circumstances. Autopsy showed the whole bronchial tree full of fluid blood and blood clot. Tracheotomy and good suction might have been of some avail.

In three of the cases, asphyxia from inhaled vomitus occurred during the recovery phase when the patient was back in bed. With adequate supervision and with the necessary equipment at hand to deal with such an emergency, this is a catastrophe that should rarely happen.

In these cases it is not enough to swab out the mouth and pharynx only and to continue with artificial respiration and oxygen. If breathing does not quickly recommence, it is necessary to suck out the trachea and bronchi. The use of a laryngoscope or bronchoscope and a sucker might prove a life-saving measure, as might laryngotomy or tracheotomy, with the insertion of a catheter connected to an efficient sucker. In Case 9, in which vomitus was aspirated into the bronchi, the pharynx was cleared, artificial respiration was continued and a tracheotomy

was undertaken, but this did not relieve the obstruction as semi-solid lumps of food were present in the bronchi.

There are no cases in this series in which death was attributed to *status lymphaticus*, which appears to be a definite pathological entity, although rare. The more thorough the post-mortem examination, including microscopic examination of the organs, the less does one have to fall back on *status lymphaticus* as the cause of death. Unless microscopic investigation is carried out, fat embolism may be overlooked. Air embolism may occur during an operation, causing sudden death.

Deaths nowadays from pure overdose of the anæsthetic agent are not common; Case 41 is an example of such a death. The only findings at post-mortem examination were a little dilatation of the heart, fluid blood and some petechiæ on the surface of the heart. In this case two anæsthetic agents with synergistic toxic action on the heart were used in a struggling uncooperative patient, and adrenaline was used in the resuscitative stage. Chloroform was deliberately chosen because this girl had a cough with sputum, the origin of which was a few small cysts at the right lung apex.

In Case 63, death was classically asphyxial; it had taken place in the induction stage as a result of laryngeal spasm. It is not very well known that laryngeal spasm in the induction stage may be fatal, a fact that should make the anæsthetist pause before he proceeds to pour on more anæsthetic to get the patient over the spasm.

In Case 36, death occurred suddenly during the course of an operation for reduction of a traumatic diaphragmatic hernia. Spinal analgesia was used, supplemented by gas and oxygen. It was realized by the surgeon that the giving of this anæsthetic entailed a certain amount of risk, but positive pressure intratracheal anæsthesia was not available at the time, and as the patient was seriously ill it was deemed advisable not to postpone the operation any further. During the operation, which was proceeding satisfactorily, at the point where the intestine was pulled through the opening in the left side of the diaphragm, back into the abdomen, there was a sudden rush of air into the thorax, with an almost immediately fatal result from the penumothorax so produced.

In Case 51, the patient had been previously operated on for a carcinoma of the left side of the tongue; radon seeds had been successfully implanted. A block dissection of the glands of the neck had been carried out on the left side, and on this occasion the dissection of the right side was done. "Pentothal" and curare were used, followed by endotracheal cyclopropane. Death occurred two hours after the operation was completed from respiratory obstruction due to traumatic œdema of the larynx. The tissue about the vallecula showed bruising and hæmorrhagic œdema; there were œdematous bullæ about the approach to the larynx; there was also much œdema and bruising of the hypopharyngeal region.

In the other case (Case 49) in which curare was used, the patient was not able to maintain spontaneous respiration at a sufficient level to obviate death from respiratory failure.

Of the deaths associated with spinal anæsthesia, one (Case 36) has already been commented on; the cause of death was the inrush of air into the thorax upon reduction of the diaphragmatic hernia. In Case 39, sudden death occurred in the patient suffering from purpura which simulated intestinal obstruction. In the patient operated on for prostatic obstruction (Case 38), it is noteworthy that the pulse became feeble when the patient was turned on to his back twelve minutes after the injection in the preparation for the operation, and in this case the heart, which was pathological, failed before respiration. Any drop in blood pressure, either due to the "Nupercaine" or from blood loss and shock, would have an adverse effect on a heart already diseased; the drop in blood pressure means a poorer coronary circulation to heart muscle already diseased. In Case 40 respiratory failure preceded cardiac failure by some minutes, the heart could still be felt beating through the diaphragm after respiration had ceased, and the post-mortem findings supported this.

There were two patients in this series (Cases 43 and 22) who died whilst being anæsthetized for the operation of suprapubic cystostomy. Both of them were bad "risks", and the choice of "Pentothal" in the one case, and of ether in the other, resulted in death. The "Pentothal" was administered rapidly in one case, and there was almost simultaneous cessation of respiration and heart beat. Probably neither of those deaths would have occurred had local anæsthesia been used.

There were two deaths in which pulmonary embolism was a feature (Cases 31 and 16); this had followed previous operations in each instance. In another case (Case 45) death occurred from coronary thrombosis, during the operation. Gross coronary arterial disease may be found in any person past middle age, with a main vessel or its branches virtually occluded from degenerative changes in the wall with gross intimal thickening and calcification. Sudden death at any time may occur in these people, and this may take place during any operation.

Death occurred in one patient (Case 35) who was undergoing subtotal thyreoidectomy under intratracheal ether anæsthesia. This patient, who had a large nodular toxic gland, had settled down well with pre-operative medical treatment and rest. Anæsthesia was induced with a little ethyl chloride and the patient was very nervous at the outset with a pulse rate of 140 per minute. A change to ether was made and from that point onwards only ether was given. When the patient was moved from the anæsthetic trolley on to the table she developed a very sudden rise in pulse rate and became cyanosed. From then on the anæsthetic was a stormy one; the pulse settled down again, but there were periods of cyanosis intermittently during the operation. At the conclusion of the operation, whilst only oxygen was being administered, death occurred from cardiac failure. Autopsy showed bilateral complete symmetrical collapse of the lungs without any mediastinal displacement. This is the normal position for the lungs when the chest is opened at autopsy—the position seen in the fœtus before respiration is established. The airway was clear. At the apex of both lungs there were old apical tuberculous scars and some small emphysematous bullæ. One bleb at the right apex was ruptured, and a few bubbles of gas escaped from this when it was examined under water and under pressure. The lungs were easily distended with air from a pump under water, and air escaped. It was thought that the tear in the apical bleb caused collapse of the lungs. There was no evidence that air had entered the mediastinum from the neck. The anæsthetist's impression was that the trachea was continually being interfered with by the surgeon, so causing respiratory difficulty and cyanosis, although this was not the case. I have seen a similar case in which a pneumothorax developed from rupture of an apical bleb during a partial gastrectomy. The heart muscle already involved by coronary atheroma was unable to withstand the anoxæmia during the operation.

Case 29 presents an unusual but interesting feature. This patient was suffering from cardiac failure with œdema; there was a double hydrothorax. A few seconds after the child was delivered, the anæsthetist noticed the mask filling up with frothy fluid and death quickly ensued. This was a typical example of acute pulmonary œdema; it occurred at the time the pressure was released in the abdomen and so on the thorax. The sudden release of the pressure resulted in acute pulmonary œdema from dilatation of the already diseased heart. Sudden dilatation of the heart with death sometimes occurs from sudden release of intrathoracic pressure.

In many of these patients there was frank cardiovascular disease, as there commonly is in patients past middle life. This should be remembered when an anæsthetic is administered, even though clinical examination shows the patients to be apparently very good "risks". Adequate oxygenation, the safest anæsthetic and its minimum, the minimum of trauma and shock should be the aim, as poor oxygenation, a fall in blood pressure, prolonged anæsthesia, shock and trauma may be too much for heart muscle that is already diseased and served by coronary vessels that are thickened, narrowed and

sclerosed by the degenerative changes that accompany advancing years.

When an inquest is held the following matters are usually the basis of the inquiry: (*a*) Was the operation necessary? Was proper assent to its performance obtained? (*b*) Was an anæsthetic necessary? (*c*) Was the patient previously examined and found a fit subject for the anæsthetic? (*d*) Was the patient properly prepared? (*e*) Was the anæsthetic appropriate? Was it of standard purity? (*f*) Was the anæsthetic skilfully administered? (*g*) If surgery had commenced was it proceeding in accordance with accepted standards of practice? (*h*) If there was a change of anæsthetist during the administration—why? Was it a factor in the death? (*i*) When unfavourable symptoms and signs manifested themselves were the appropriate remedial measures adopted?

Summary.

This analysis of an unselected series of deaths under anæsthesia draws attention to the pathological state in each case. There is a certain amount of risk with every anæsthetic administered, and that risk can only be made the irreducible minimum when due regard is paid to the well established principles governing the administration of anæsthetics and the immediate after-care of the patient.

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DEATHS DURING ANÆSTHESIA.

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THE question was asked by some of the anæsthetists concerned in the cases listed by Dr. Bowden in his paper entitled "Pathological Findings in Some Deaths during Anæsthesia" (see page 86): "How could this death have been prevented?" For purposes of discussion, the cases are grouped as follows.

Group A. Death due to natural cause for which operation was designed: Cases 12, 15, 16, 19, 20, 21, 25, 26, 28, 29, 31, 34, 37, 39, 45, 46, 47, 48, 50.

Group B. Death due to operative procedure, for example, shock, hæmorrhage, vagal inhibition: Cases 17, 18, 30, 32, 33.

Group C. Death incidental to anæsthetic risk: (i) Vomiting: Cases 1 to 14. (ii) Pulmonary collapse: Cases 35 and 36.

Group D. Deaths due directly to anæsthesia: (i) Bad choice: Cases 22, 23, 24, 27, 38, 40, 51. (ii) Overdose in the gravely ill; repetition of intravenous agent, Cases 41, 42, 44, 49.

In deaths due to natural causes for which the operation was designed and those due to operative procedures (Groups A and B), the anæsthetist, obviously, could not have prevented death. Nearly one half (24) of the cases come under these two headings.

The remaining 27 cases (Groups C and D) must all be regarded as theoretically preventible—theoretically because, in some cases, the post-mortem examination brought to light diseased conditions not apparent or more extensive than was suspected prior to the administration of the anæsthetic. Although some of the complications which caused death may have occurred—with the same fatal result—no matter how skilled the anæsthetist, yet it is apparent that not in every case were facilities at hand for adequate treatment. There are so many unknown factors in these deaths, such as the unexpected reactions of the patient, operative complications and the experience of the anæsthetist, that it is often impossible to say with certainty, however much it may be suspected from the report, that an individual death is preventible. The reports made to the coroner in these cases often lack essential details; for example, in only six cases is any mention made of premedication. There often appears to be a discrepancy between the quantity of anæsthetic used and the duration of the anæsthesia, while the fact that "Pentothal" is stated to have been given "rapidly" or "slowly" may mean anything. Therefore, in endeavouring to answer the original question, one can only discuss the cases according to general anæsthetic principles and mention some of the essential precautions which should be taken in administering the anæsthetic concerned for that particular operation. No excuse is offered for the elementary nature of some of the precautions advised; the fact remains that in many cases they have presumably not been observed or, if so, mention has not been made of them in the reports.

In the first fourteen cases typical asphyxia was the cause of death.

Five of these deaths were the results of accident and in all cases food was found in the stomach of the subjects five to twenty-eight hours after the last meal. The time interval between the last meal and the occurrence of the accident is more important as an indication as to whether the stomach contains food than the time elapsing between the last meal and the administration of the anæsthetic. The valuable lesson to be learnt is that in cases of trauma there is no fixed time limit to the emptying of the stomach, and when it is not practicable to empty the stomach prior to administering the anæsthetic, vomiting should be anticipated and facilities must be at hand to cope with it. These include a table which enables full use to be made of gravity by lowering of the patient's head, and a sucker. An introducer and an endotracheal tube, if the anæsthetist is proficient in their use, should also be available. It is essential to remove all vomitus *et cetera* from the mouth and pharynx before artificial respiration is commenced, otherwise foreign material may be sucked into the trachea. As a last resort, tracheotomy should be performed and a sucker inserted through the opening in the trachea.

After completion of an operation on nose, throat or mouth, the patient should be turned on his side to be removed from the theatre and put to bed in that position until fully recovered from the anæsthetic. During this period the patient should be watched by a fully trained nurse. No patient should be removed from the operating theatre showing any trace of cyanosis.

The two dental cases illustrate the danger of a "single dose" method—an unjustifiable procedure, particularly for multiple extractions. There is the probability that the period of anæsthesia will not be sufficiently long, so that, if the operation is to be completed, a reapplication of the mask and another dose of anæsthetic are needed —thus the risk of pulmonary abscess and asphyxia is increased. Some method of continuous anæsthesia, enabling the pharynx to be packed off, is essential if the patient is to be protected from the above risks.

CASE 1.—Atropine given twenty minutes before operation is far too late; had it been given earlier the excessive secretion of froth and mucus might not have occurred.

CASE 2.—This was presumably an elective operation; therefore the patient should not have had food in the stomach.

CASE 11.—A baby was given open ether for the relief of convulsions. If an anæsthetic is ever necessary for infantile convulsions, the anæsthetic of choice is chloroform.

CASE 13.—Asphyxia from a laryngeal spasm alone is of interest because of the frequency of the development of a lesser degree of laryngeal spasm during the induction stage of inhalation anæsthesia and the rarity of a complete spasm causing death. The removal of the mask and a supply of air or oxygen are usually sufficient to abolish the spasm.

CASE 23.—The operation was dental extraction for pyorrhœa. The cause of death was a dilated heart with degenerative changes in the myocardium. A man, aged fifty-eight years, obese and a confirmed alcoholic, should have had the extractions carried out under local anæsthesia. This was advised, but was refused by the patient.

CASE 36.—The reduction of a diaphragmatic hernia under spinal analgesia caused collapse of a lung as air entered the

pleural cavity. The result would have been the same with any anæsthetic other than one given through an endotracheal tube. If there is a possibility that the chest will be opened, some positive-pressure apparatus should be at hand.

CASE 37.—Although death was due to natural disease, this patient was a bad "risk" and a high spinal anæsthetic was not the one of choice.

CASE 38.—The patient was elderly and a bad "risk", therefore a spinal anæsthetic was not the one of choice.

CASES 39 AND 40.—The solution of "Nupercaine" 1:200 without glucose has a specific gravity of 1006 and is regarded as isobaric. Unfortunately the specific gravity of cerebro-spinal fluid varies. This variation is expressed by different authorities as being between 1001 and 1010. The exact figures do not matter, but the fact that it does vary is important. Therefore this particular solution may prove to be isobaric, hypobaric or hyperbaric. For this reason it is safer to use a solution that is definitely heavier or definitely lighter than the cerebro-spinal fluid.

CASE 41.—No comment is necessary.

CASE 42.—In reduction of a fractured femur the depth of anæsthesia required to obtain the necessary muscular relaxation would have been attained with greater safety with ether.

CASE 43.—A man, aged seventy-three years, and only a fair "risk", should have had a suprapubic cystostomy performed under local anæsthesia.

CASE 45.—"Pentothal" was not the most satisfactory choice in this case with the respiratory system already embarrassed by grave oxygen lack.

"Pentothal" was used in three cases (43, 44, 45). This potent anæsthetic should never be administered rapidly. In every case the first fraction must be small and the patient's reactions observed. When consciousness is lost no more solution is injected for at least thirty seconds, or even longer if the respiration becomes very depressed. Premedication should not be excessive because it depresses the respiration, but an injection of atropine is essential to assist in the prevention of laryngeal spasm. A 2½% solution of "Pentothal" gives more control than a 5% solution, and is to be preferred unless the patient is very robust.

Prophylaxis.

Of the asphyxial group (omitting cases 2, 8, 11 and 12) ten patients died as a direct result of an anæsthetic administered to them, all being good "risks". Eight were under the age of twenty years, one was aged twenty-two years and one was aged forty-one years. Furthermore, seven of them were undergoing elective operations, either dental extraction or tonsillectomy. All these deaths should be avoidable. Operations about the mouth and throat should be performed in a properly equipped theatre, if the facilities already mentioned as essential are to be available. The general public regard the above procedures as minor operations, but it should be emphasized to the patient or his relatives that there is no such thing as minor surgery, and certainly there are no minor anæsthetics. If the risks are explained, few will object to being admitted to hospital. Finally, continuous anæsthesia should be available for oral surgery.

The remaining cases (Groups C and D, Case 41 omitted) are in a different category as regards prophylaxis. In these cases various pathological conditions (sometimes unsuspected before operation) contributed to the patient's death, and it is, therefore, impossible to assess the part played by the anæsthetic alone. However, in some cases it would appear that a more satisfactory choice of anæsthetic might have been made. Here close collaboration with the surgeon is essential, and in the presence of bad risks or complex conditions the services of a specialist anæsthetist might well be sought.

The more recent agents have greatly reduced the inevitable and ever-present risks of general anæsthesia. They will continue to do so only if administered by an anæsthetist having a thorough knowledge of their actions, risks and limitations, and of the special indications for their use. Their administration should be confined to specialists.

Fundamentally, adequate training in anæsthesia is the most effective means of preventing anæsthetic deaths. The Australian Society of Anæsthetists is striving to improve the teaching of students and resident medical officers and to provide post-graduate instruction. There are signs that some headway is being made, but the goal is still far ahead.

In some American hospitals it is the custom for all notifiable deaths to be frankly discussed at a meeting of the staff. The adoption of this practice in our public hospitals would be of benefit, not only by keeping the whole surgical team "on their toes", but by ensuring that all such deaths were critically investigated.

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TODAY'S PROBLEMS OF MENTAL HOSPITALS.[1]

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Brisbane.

THE modern problems of mental hospitals cannot be understood or appreciated without a careful study of the historical trends in the treatment of mental diseases. A complete historical survey is beyond the scope of this paper. It must suffice to draw attention to certain landmarks of psychiatric history which of themselves and without amplification may make certain deductions appear to be without substantial proof. To those who might dispute the relevancies of this paper I would suggest a sincere perusal of history, knowing full well that history has a remarkable facility for teaching.

The magnificent age of Pericles in the fourth century B.C. found Hippocrates enunciating that mental sickness originates from natural causes like other affections, and that from nothing else but the brain come joy, despondency and lamentation; and that by the same organ we become mad and delirious, and fears and terrors assail us, some by night and some by day.

In 100 B.C. Asclepiades of Prusa prescribed diet, massaging, bathing and exercise for his mentally sick patients. He advocated light and sunlit rooms so that delusions and fears would be dispelled in an environment of cheerful reality.

In the second century A.D. Areteus of Cappadocia anticipated Kraepelin's classifications in essentials by nearly 2000 years. At about the same time Soranus of Ephesus taught that patients should be in well-lit, well-aired rooms with regulated temperatures and in conditions of comfort and good sanitation. They were not to be irritated by roughness or officiousness and visitors were to be mostly forbidden.

Apart from an occasional oasis such as the colony at Gheel founded on the religious legend of Saint Dymphne, the succeeding centuries were notable for the universally accepted "obsessions" of demon possession and witchcraft. The arch fiend devised human torments by tricks and subterfuges and must be attacked by cruelties and atrocities that would make a human habitation too unsavoury even for the Devil. For centuries the distressed and tortured mind must be scorned and treatment must be harsh—a retrogression almost incomprehensible following the enlightenment of the Golden Age of Greece.

In the sixteenth century Sir Thomas More writes of a mentally sick person: "I caused him to be taken by the Constables and bound to a tree in the street before the whole town, and then striped till he waxed weary. Verily, God be thanked, I hear no harm of him now."

And so it went on. The harmless insane were subjected to the prevailing rigors of therapy, the dangerous cast into prisons with criminals, the pauper and docile insane drafted into poor houses. Colonial America, with as yet no institutions, developed a system of pauper auctions where the successful bidder tendered the lowest price to relieve the community of its responsibility. Employable insane were always in demand.

[1] Read at a meeting of the Australasian Association of Psychiatrists at Brisbane on June 8, 1948.

The racket of "passing on" paupers and insane from one county to another was common. So the stigma of insanity persisting through centuries became deeply ingrained into our social, religious and political life and in our medical attitudes.

In 1792 Phillipe Pinel cast off the manacles and chains of the insane in Bicerti.

In 1792 William Tuke founded the "York Retreat".

In 1841 Dorothea Lynde Dix began her forty years' crusade in America, Europe and England to better conditions for the insane, all of which developed a policy of State care, and many substantial institutions were built for the safe custody of the mentally sick. The Kirk-Bryde design was the accepted constructional plan of this period and this type of structure can be seen today in many countries.

In 1908 Clifford Beers published "The Mind that Found Itself", and so developed the mental hygiene movement and its many ancillary services.

The Victorian era saw the rise of the medical administrator. It became uncommon to discover a mental institution that was not efficiently managed. The cult of efficiency inevitably drifted towards financial economies.

Almost contemporaneously with the mental hygiene movement began the epoch of the medical philosophers, and the outstanding clinical exponents Sigmund Freud, Carl Jung and Alfred Adler from whom developed the techniques of psychoanalysis.

The twentieth century was ushered in by the work of Dr. Binet and Dr. Simon, leading to the evolution of psychometrics and the clinical psychologists.

Mental institutions had produced several notable men who filled the ranks of a sparse specialty, the alienists. Such men as Mercier and Clouston were outstanding, but the experienced mental hospital doctor was the recognized authority on insanity.

Now there developed two schools: the one experienced in the care of psychoses and the other applying Freud's teachings to benefit the psychoneurotics and prepsychotics; the one struggling in a despond of traditional stigma and the other basking in the glamour of a novel and revelationary therapy. Many of us know the bitter and acrimonious controversies that arose.

The modern problems of mental hospitals can best be illustrated in a positive way by a brief examination of the minimum standards scheduled by the American Psychiatric Association, nearly all of which are applicable to Australia.

1. The chief executive officer must be a well-qualified physician and experienced psychiatrist whose appointment and removal shall not be controlled by partisan politics.

2. All other persons employed at the institution ought to be subordinate to him and subject to removal by him if they fail to discharge their duties properly.

3. The positions and administrations of the institution must be free from control for the purposes of partisan politics.

4. There must be an adequate medical staff of well-qualified physicians, the proportion to total patients to be not less than 1 to 150 in addition to the superintendent, and to the number of patients admitted annually not less than 1 to 40. There must be one or more full-time dentists.

5. There must be a staff of consulting specialists at least in internal medicine, general surgery, organic neurology, diseases of the eye, ear and throat, and radiology, employed under such terms as will ensure adequate services.

6. The medical staff must be organized, the services well defined and the clinical work under the direction of a staff leader or clinical director.

7. Each medical service must be provided with an office and an examining room, containing suitable conveniences and equipment for the work to be performed, and with such clerical help specially assigned to the service as may be required for the keeping of the medical and administrative records.

8. There must be carefully kept clinical histories of all the patients, in proper files for ready reference on each service.

9. Statistical data relating to each patient must be recorded in accordance with the standard system adopted by the Association.

10. The patients must be classified in accordance with their mental and physical condition, with adequate provision for the special requirements for the study and treatment of the cases in each class, and the hospital must not be so crowded as to prevent adequate classification and treatment.

11. The classification must include a separate reception and intensive study and treatment department or building, a special unit for acute physical illnesses and surgical conditions, and separate units for the tuberculous, and the infirm and bedfast.

12. The hospital must be provided with a clinical and pathological laboratory, equipped and manned in accordance with the minimum standards recommended by the Committee on Pathological Investigation.

13. The hospital must be provided with adequate X-ray equipment and employ a well-qualified radiologist.

14. There must be a working medical library and journal file.

15. The treatment facilities and equipment must include: (*a*) A fully equipped surgical operating room. (*b*) A dental office supplied with modern dental equipment. (*c*) Tubs and other essential equipment for hydrotherapy operated by one or more specially trained physiotherapists. (*d*) Adequately equipped examination rooms for the specialties in medicine and surgery required by the schedule. (*e*) Provision for occupational therapy and the employment of specially trained instructors. (*f*) Provision for treatment by physical exercises and games and the employment of specially trained instructors. (*g*) Adequate provision for recreation and social entertainment.

16. Regular staff conferences must be held twice a week where the work of the physicians and the examination and treatment of the patients will be carefully reviewed. Minutes of the conference must be kept.

17. There must be one or more out-patient clinics conducted by the hospital in addition to any on the hospital premises. An adequate force of trained social workers must be employed.

18. There must be an adequate nursing force, in the proportion to total patients of not less than 1 to 8, and to the patients of intensive treatment and acute sick and surgical units of not less than 1 to 4. Provision must be made for adequate systematic instruction and training of the members of the nursing force.

19. Mechanical restraint and seclusion, if used at all, must be under strict regulations and a system of control and record by the physicians, and must be limited to the most urgent conditions.

However, the most pressing problems of modern mental hospital lie within the ranks of the medical practitioners.

There is a resistant and isolationist attitude on the part of mental hospital medical officers. There is an unsympathetic and patronizing pose by those practising as private specialists in psychiatry. These attitudes are, as it were, mutual catalytic agents, each augmenting the problem and each group blameworthy. The modern mental hospital must shed its isolationism and the private practitioner must follow his patient into the mental hospital as he does with his patients in general hospitals. He must not discard the psychotic, the intractable psychoneurotic, or the patient with an unresolved behaviour problem as he would like to shake off the plague.

The other problem in our ranks as medical practitioners is the delusion that insanity is irremediable. Many of my friends and colleagues practising in other branches of medicine say: "Yes, it is very nice to do this and that. Poor beggars, they deserve everything that can be done; but what a hell of a specialty! After all you cannot do anything, can you?"

You have seen a short film illustrative of some of the highlights of a modern mental hospital as seen by a layman.

You are at present entertained in the more recent buildings of a modern hospital and you yourselves can assess what has been achieved in two or three decades, compared with the asylums of last century.

The mental hospital has a special service to give the community; there is much yet to accomplish. We as colleagues can achieve all by mutual respect and mutual assistance; we can gain nothing by disparagement, by recrimination or by misguided reformative zeal.

ADMINISTRATION AND MENTAL INVALIDITY: AN HISTORICAL INTRODUCTION TO A RECURRING PROBLEM.[1]

By JOHN BOSTOCK,
Brisbane.

WHENEVER new plans, new methods, new concepts raise hopes for the future, it is fitting to review them in the light of history. Such a course offsets the euphoria associated with conferences in far cities. They have pleasantly energizing qualities comparable to the Turkish bath and the rub of a towel.

It is the historian's duty to complete the process by turning on the cold shower. Although shivering may occur, there will be the realization of thought more clearly attuned to reality. History reminds us that every forward step has inherent, recurring and sometimes persistent difficulties. The story of the early years of mental hospital administration throws light on to the genesis of these difficulties in hospital administration. Many are identical with those of today. As the personnel have died, it is possible to avoid the veil of secrecy which obscures a view of contemporary affairs.

The first Australian mental hospital was founded by Governor Macquarie at Castle Hill, New South Wales, in 1811. The institution was a renovated farm house. In 1814 George Suttor became superintendent and after some years' service was dismissed. The available evidence is definitely favourable to the reputation of our first known superintendent. There are strong grounds for believing that he was the victim of circumstance.

Although asylum management was the direct concern of the Governor, he did not visit the hospital during the five years of Suttor's administration. The superintendent had to struggle for comforts for the patients. Lastly he was forced to reprimand a doctor for being negligent, thereby acquiring a verbose, obsequious and place-seeking opponent, who undermined his authority and publicly accused him of murder.

Four men had been sent to get firewood. One of them was Francisco, a Portuguese maniac. There was a dispute. He was hit on the head with an ax by the lunatic Griffiths. Dr. Parmeter at the Coroner's Court blamed the Superintendent for allowing lunatics to labour or fetch wood without his permission. No allowance was made for the meagre staffing of the hospital which rendered patient labour a necessity. An analysis reveals that judgement was made by an authority who was quite incapable of knowing the facts and who could be prejudiced by a plausible place seeker.

Authority was indifferent to the lot of the insane, asylum administration was run on skinflint lines, the hospital was understaffed and the administration was inadequately supported against criticism.

Our details concerning the administrative difficulties of the second hospital at the Liverpool Gaol (1825-1838) are meagre. It is, however, interesting to note that the place was a makeshift. The patients were taken from Castle Hill in 1825 on the flimsy excuse that another department wanted the land. This lack of priority for mental invalids is in itself a recurrent phenomenon.

The third mental hospital at Tarban Creek, site of the present Gladesville Mental Hospital in Sydney, was almost completed in 1837. The first superintendent, Mr. Joseph Thomas Digby, was imported from England. His wife became the first matron. He arrived in July, 1838, and immediately commenced to prepare for the admission of patients.

The story of Tarban Creek from 1837 to 1850 epitomizes many recurring problems of hospital administration. Mr. Digby arrived full of enthusiasm for his new position. Discouragement dogged his footsteps until the day of his departure. Those who see paradise on the wings of bureaucracy should read the story of the Digbys. No sooner was Digby installed than his pay was questioned and his allowances were pruned. He had to fight each year for better conditions for his patients against a barrier of indifference. The chief concern was not, "Is this efficient?", but "Is it too costly?" The story of Mr. Suttor is repeated on a grand scale. The chief bureaucrat who almost of necessity is out of touch with the realities of hospital administration knocks back each request as though refusal was a ritual.

Two incidents will suffice.

As early as March, 1839, Mr. Digby made a requisition for 2240 pounds of straw as ordered by the Surgeon. On June 11, 1839, Mr. Digby had to write reasons for his request. He pointed out that "we have 18-20 dirty patients for which is allowed four pounds per crib. This is necessary to prevent the patients being sore and excoriated and also for cleansing". Were it not for a crib which "conveys the water filtered through straw into a vessel underneath a much greater amount would be required".

His Excellency Governor Gipps replied: "I cannot sanction this demand for straw, which is in New South Wales a very dear article. The charge would amount to 3d. a day at least for each patient. Mr. Digby will surely be able to suggest some less expensive method of keeping the people clean!!!"

Mr. Digby answered in a three page letter. He pointed out that "paliasses and bolsters of coir are more expensive. Straw is used at St. Luke's, Bedlam and Hanwell. Our cribs save bedcases and soap as the continual wetting of the bedcase by urine, etc., rots and destroys them in a very short period, and does not even then do away with the stench and occasions more labour". He also told Governor Gipps about the helplessness of the patients, that he conserved the straw as though he used it for himself and that as he did not know a suitable substitute the Governor might "be pleased to order a board to find the correctness of my remark".

On July 19 His Excellency wrote: "Let the quantity of straw herein demanded be allowed."

A few days later Mr. Digby asked if a shroud could be allowed to cover the dead. There was a reply that respectable people had their own shroud.

Similar examples were frequent. From them it can be argued that bureaucracy is an efficient system for the purpose of discouraging initiative and enterprise.

It was not long before Mr. Digby encountered the recurrent problem of the masterful architect, who designs buildings to satisfy his own ego. Architect H. M. Lewis made the passageways without skylights. He thought that they should be nearly dark so that the keeper should not be easily perceived moving from one group of cells to another. Mr. Digby had to cope with shoddy workmanship in the building as the contractor had not completed work up to specification.

Those of you who have caught a fish saddled with a remora, half-choked with sea lice, and impeded by barnacles have seen an illustration of a type of administration in which a number of people in diverse departments must be satisfied. Each adds a quota of restriction and the force of the original request is slowed and often completely arrested. As an example, out of many, may be cited the request for a horse and cart needed to transport goods and water for Tarban Creek. The colonial architect asked for a bullock. The storekeeper stated that it was not an article of store. Mr. Digby was then authorized to purchase one at a price of £10. This authority was cancelled four days later. Finally he was told by Governor Gipps to procure an ox.

Problems of Hospital Administration.

The above may be regarded as unavoidable administrative pinpricks of any community relationship. They are definitely recurrent phenomena. Let us now consider some more specific problems of mental hospital administration.

Staff Difficulties and Understaffing.—In the days of Mr. Digby keepers came and went with regularity. Married couples were usually employed, but often only one of the partners was satisfactory. Then, as now, it was found difficult to obtain a sufficiency of attendants imbued with patience, tolerance and good humour, so necessary for dealing with the mentally afflicted.

[1] Read at a meeting of the Australasian Association of Psychiatrists at Brisbane on June 9, 1948.

There is frequent emphasis on the existence of understaffing. Insufficient keepers and nurses were provided. Patients were expected to work without sufficient supervision.

Risks.—The peculiar natures of some hospital patients create dangers of a serious nature. The case of the maniac Francisco has been mentioned. Escapes were common in the early days. It was necessary for Mr. Digby to fight tooth and nail for better locks, securer windows and means for more adequate supervision. Difficulty in providing for such contingencies is largely due to an inability of those without first-hand experience of mental hospitals to understand the reality of the risks involved.

Overcrowding.—Running like a recurrent contagion through the whole of Mr. Digby's superintendence is the problem of overcrowding. One incident must suffice. In 1840 the number of patients was 100. A year later there were 135, and two people were put in each cell. Mr. Digby stated that it was absolutely necessary either that an addition should be made to the building or that harmless patients should be removed. His Excellency Governor Gipps replied that there were no funds available. Four days later Mr. Digby again asked for increased facilities and suggested improvisation at the small expense of taking in a portion of the airing court.

The above illustrates a recurring theme. The caption of "No Funds, Overcrowding, Insufficient Facilities and Cheap Improvisation" is descriptive of much mental hospital administration in succeeding years.

Provision for Chronically Ill Patients.—As early as 1844 Mr. Digby stressed the need for a separate establishment for chronically ill, old and harmless patients. There is a modern tone in this oft-repeated request as in the answer: "It cannot be done."

Difficulties in Connexion with Certification.—Legal action for alleged wrongful detention occurred in 1843. A certain Captain Hyndman, being manic, was placed in Tarban Creek. Shortly afterwards he recovered and brought an action for assault and false imprisonment. The sum of £100 in damages was awarded.

Segregation of the Sexes.—Segregation of the sexes in an institution calls for incessant care. In 1843 two patients became pregnant whilst inmates of the asylum. It was discovered that the culprits were members of the male staff.

The Plethora of Rules.—Before 1850, three different sets of rules for the regulation of mental hospitals had been devised. They are in an ascending scale of completeness and ingenuity. The last one was introduced by Dr. Campbell. Its grasp of the minutiæ is seen in the regulations for cooks.

The cook is to see that "nothing whatever that is eatable and wholesome shall be thrown into the waste tub. . . . He is to keep the tables and utensils clean at all times, and not to allow any swearing, noise, or disturbance in the kitchen or cook house. . . . He is not to allow any person whatsoever to smoke in the kitchen, or even to light a pipe, and to have his kitchen in perfect order each morning by ten o'clock for inspection. . . . He is to see that the hair of his assistants' heads be kept short and combed and that their hands and nails, as well as the whole of their persons, be kept constantly clean, particularly when handling the food. They should all be provided with pocket handkerchiefs and clean aprons".

Let us remind ourselves that although the framing of rules and regulations is an interesting pastime, it is reminiscent of schizophrenic phantasy. Reliance cannot be placed on the promulgation of rules and regulations. They will invariably be broken, their multiplicity is in itself an inducement to rebellion. Even Dr. Campbell's perfection in rule making could not prevent the recurrence of subsequent trouble. A survey of psychiatric history indicates that the acme of administrative efficacy is more likely to be attained with a paucity rather than a plethora of rules.

The Public versus the Insane.

The existence of the foregoing recurring problems which can occur in every mental hospital must be considered against the background of public hostility or apathy. It is clearly discernible in an historical review.

The asylum at Castle Hill, buried in the far outskirts of Sydney, although established by Governor Macquarie, suffered from his subsequent disinterest. For quite insufficient reason an unsuitable substitute was found at Liverpool. The new asylum at Tarban Creek received much criticism on the grounds that it was too palatial for lunatics. Records show that improvements were not welcomed. Innovations such as new wards, fences for the grounds, suitable gardens and airing courts were introduced only after considerable pressure by the superintendent or as sequelæ to public inquiry.

There is no doubt that society has regarded its mental invalids as anathema. It treats them by evasion and is happy when they are forgotten. This is a well-known psychological mechanism. Mental patients involve their families in trials and tribulations, sometimes in terror and danger, often in shame and disgrace. It is not surprising that families in the main consent to their removal into distant inaccessible locations.

The keepers and administrators of the public purse, realizing that the insane are a small number of people who are politically inarticulate, treat them with severe economy. In this they are assisted by the mutism of the patients' relatives; a few wish the patient to die, the majority do not desire anyone to know of the skeleton in the family cupboard. The patients themselves have neither votes nor voice beyond the confines of their hospital grounds. The result is a state of public apathy amounting to neglect.

The situation is well shown in the historic struggles between Mr. Digby and the higher administration. He has minor victories, but in the main little change is made in the care of the insane until public and official indifference is aroused by a full-scale inquiry.

The manner of its inception is significant.

About May 5, 1846, the Government received a report alleging inefficiency and implying cruelty at Tarban Creek. On May 28 *The Sydney Morning Herald* published the first of a series of five articles entitled "The Lunatic Bill" under the *nom de plume* "Iatros". They painted a damning picture of the existing Tarban Creek asylum and a glorious panorama of the heights to which it might aspire under new management. As controversy concerning official visitors had drawn the asylum administration into the ambit of politics, it is not surprising that a full-scale inquiry was held. It commenced in June, 1846. Attention was given to the anonymous evidence of a manic ex-patient. The attack largely centred on the administration of a non-medical superintendent and his paucity of records. Although there was a creditable record of achievement by Mr. Digby and the medical officer Dr. T. Lee had carried out instructions, the former was derated and the latter dismissed.

Our records show that in spite of the fact that a superintendent suggests improvements and is frustrated by higher authority, he can be admonished for their non-fulfilment. There is vindication of the principle that when faced with criticism the higher authority must not admit failure; it must find a scapegoat and make delightful promises of a rosy future.

By these means an apathetic public is again lulled into an amnesia for mental invalids. The futility of such methods is shown by the recurrence of an inquiry in 1850. There was another a few years later. There will be no need to remind you that since 1943 there have been public inquiries and Press vendettas on mental hospital administration in at least three Australian States. They recur almost with the constancy of a comet passing along its predestined orbit and will soon return.

It is not my province to outline the complete cure for recurring public inquiries and the persistence of public torpor. They will continue until adequate treatment returns the majority of mental invalids to normality, until prophylaxis becomes an actuality and until an enlightened community ceases to differentiate socially between physical and nervous illness.

History shows that the individual citizen, whether relative or asylum official, has a continual fight against

the community urge to isolate asylums from its consciousness. The doctor has amnesia for his deaths; the mother forgets the misdeeds of her firstborn; the lover minimizes the faults of his lady. The great public tries to put asylums and mental hospitals into the background.

These comments are generalizations without reference to any State boundary. Praiseworthy efforts have been made several times and in many places to overcome the handicaps of the mentally afflicted. It is certain that every State of the Commonwealth has its Valhalla of the immortal psychiatrists who have striven and are still striving for perfection. History cheers them to further efforts; it tells them that they are fighting an adversary which lives in every age and in every place.

It will be idle to rest on one's laurels and to say that the Augean stables are cleansed—its horses can forever live in cleanliness. Even as the words are spoken a horse has dropped a new load of decay.

The faults of bureaucracy, whether in public or private enterprise, are an inherent part of all social organization. It must be clearly realized that bureaucracy is not confined to government institutions. It flowers with equal profusion in private enterprise. Bureaucracy is the natural product of large-scale organization and it can be minimized only by a constant struggle for decentralization. The exponents of nationalization, totalitarianism, universal socialism and ultra capitalism, either through self-interest or ignorance, are in the habit of forgetting this factor. They see perfection in immensity, whereas the psychologist realizes that immensity results in chaos and inefficiency.

The early history of psychiatry is important in that it sheds light upon these major problems of our community life. A small-scale experiment in a test tube is often more informative than a mass reaction. The insignificant labours of Mr. Suttor and Mr. Digby, the small-size hospitals of Castle Hill and Tarban Creek, when viewed in retrospect, have a message for today.

Their problems are our problems. They are not dependent upon specialized advances in individual psychiatric treatment. The fundamentals of administration are unchangeable. Care of the patients, reeducation of relatives and the public, and elimination of bureaucratic obstacles need ceaseless attention. Progress will be maintained, not by flow of oratory and an orgy of wishful thinking, but only by determination, planning and hard work.

The Australasian Association of Psychiatrists has a great responsibility which can be met only by vigilance, courage and ceaseless action, if it is to combat the recurring problems of mental hospital administration and mental hygiene of the community.

Concerning the latter, there is today a tendency for large-scale endeavours in extramural activities, such as child guidance centres, psychological and psychiatric clinics *et cetera*. The moment these emerge from the stage of the blue print, it is to face the age-old problems of administration. In this it is fortunate that history pinpoints the difficulties and gives a clue concerning the solution.

Let us have many agencies in the machinery of mental hygiene, but let us keep them reasonably small and sufficiently decentralized to permit the free play of open competition and public criticism.

Acknowledgements.

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INDICATIONS FOR MEDICAL AND SURGICAL TREATMENT IN ESSENTIAL HYPERTENSION.[1]

By ADDIE WALKER,
Sydney.

ESSENTIAL HYPERTENSION is the disease above all others that we are called on to treat in the medical out-patient department of the Rachel Forster Hospital, as indeed is the case among the general population.

Those of my vintage can all remember the healthy fear and respect engendered by the spectacle of hypertension. Much of this has given way to a saner outlook, as the disease entity labelled essential hypertension is no longer confused with that condition following chronic nephritis. Moreover, we have experience of a group of patients with benign, slowly progressive hypertension, who manage to lead a normal life until their demise, in the seventies or even in the eighties, as the result of a cerebral vascular accident, heart failure, or more rarely uræmia.

A great deal of experimental work has been done to try to determine the cause of essential hypertension. Goldblatt's name is foremost, with the production of generalized hypertension as a result of renal ischæmia due to the placing of a clamp upon the renal artery. Trueta is the latest and most brilliant investigator in this field of research with his studies of the renal circulation; he has demonstrated the nervous and humoral stimuli which cause spasm of the renal artery and a by-passing of the renal blood through the medulla of the kidney with resultant ischæmia of the cortex. It is thought that interference with the renal circulation in man is primarily responsible for the pathogenesis of essential hypertension, and even more definite is the assumption that in the early stages these changes are of a functional, vasospastic character and not due to structural changes in the blood vessels.

The symptoms of essential hypertension in the early stages and even in the late stages may readily be confused with those of an anxiety state—sleeplessness, consciousness of the heart's beat, headache, dizziness, sighing respiration, indigestion and breathlessness.

Clinical examination reveals a tense, anxious patient with perhaps some flushing of the face and neck and pulsation in the vessels of the neck, tachycardia, and a forcible apex beat with or without evidence of cardiac hypertrophy. The blood pressure is raised in both its diastolic and systolic readings, the urine may be clear or may contain a cloud of albumin—in the fundi may be found no changes or arteriosclerotic changes of varying degree.

It is necessary to exclude the kidney from the major criminal part in this disease by urea concentration tests, estimation of the blood urea level, a microscopic examination of the urine and an excretion pyelogram.

In treating these patients the first thing to remember is that they need reassurance, and they need it badly, for the general public's attitude to the bogy of high blood pressure is one of unmitigated fear and alarm, with a stroke, heart disease or kidney disease looming large in the consciousness.

It is admitted that psychic factors play a large part in this disease. We all have experience of patients who consult the doctor for the first time as a result of unpleasant symptoms associated with emotional stress, which has brought about an aggravation of their condition by causing an increase in the level of their blood pressure. These patients are psychologically and physiologically on guard—the stage is set for action which never or rarely takes place. They show external friendliness beneath which lie strong aggressions and anxiety; so talk to the patient about his life and his problems. Encourage the patient to talk about himself as a person, not as a medical "case". Encourage him to express his aggression

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on March 18, 1948, at the Rachel Forster Hospital for Women and Children.

by directed work and play and physical exercise if his cardiac condition permits. And if you can make no progress with him, do not hesitate to ask for the help of a psychiatrist.

Sedation and reasonable hours of rest are essential. Phenobarbitol and bromide are the usual drugs used in this respect, with chloral hydrate or one of the more complex barbiturates such as "Nembutal" or "Amytal" in the more recalcitrant cases. Dieting is necessary in cases associated with obesity. In the benign cases no other treatment is necessary than that outlined; but these patients should be examined at least once a year in order to check their physical condition and the height of the blood pressure.

We were taught not to try to lower the blood pressure in hypertension; but the relief afforded to the patient when this is done makes it impossible to doubt the wisdom of such a course.

In those cases of hypertension in which progress of the disease is obvious—the blood pressure is rising, and the symptoms become increasingly severe, particularly those of headache and dizziness—it is well worth while to consider the operation of sympathectomy. Even minor vascular accidents such as cerebral vascular spasm do not contraindicate this course.

The age of the patient selected for sympathectomy is important; it is preferably between twenty and forty-five years, although the upper limit is quoted as fifty years. The blood pressure should persistently be 200 millimetres of mercury or over (systolic), and above 100 millimetres of mercury (diastolic), and there should be no clinical evidence of cardiac disorder. It is necessary to demonstrate that the results of kidney function tests are within normal limits—that is to say, the urea concentration test should give normal results and the blood urea level should not be over 45 milligrammes. The excretion pyelogram should show no abnormality. An electrocardiogram should reveal only those changes associated with left ventricular hypertrophy, with no evidence of coronary sclerosis. Ophthalmoscopic examination should reveal arteriosclerotic changes of mild to moderate grade—arteriolar constriction, tortuosity and arteriolar nickings of the veins at crossings.

After the patient has been admitted to hospital, blood pressure readings are taken every hour for twenty-four hours during the "Avertin" or "Sodium Amytal" tests. These should show a lowering of the figures to normal or near normal.

It is necessary to know your patient well, so that you will not confuse progress of the disease into a more severe form with a temporary rise in the blood pressure occurring in the benign type and due to anxiety or to an emotional disturbance.

The following contraindicate operation: renal failure, coronary sclerosis, cardiac failure, cerebral hæmorrhage, severe retinal arteriosclerosis of "silver wire" type, and responses to all tests indicating a fixed type of blood pressure.

In malignant hypertension in the early stage, before renal or circulatory failure is well advanced, surprisingly good results have been obtained by operation in a percentage of cases; repression of the eye changes and ability to return to work have been noted. The medical treatment of these patients is so hopeless that I think they should be subjected to operation if they are examined early enough.

For patients obviously unsuited to operation the use of thiocyanate salts should be considered. In the treatment of those patients who have a persistent blood pressure about the range of 260 millimetres of mercury (systolic) and 140 millimetres (diastolic), who complain bitterly of headache and giddiness and who may suffer from angina and minor vascular accidents, thiocyanate salts are worth a trial.

The thiocyanate salts, sodium or potassium, are vasodilators and thyreoid depressents. Before prescribing them, ensure that the renal concentration test results are satisfactory. The drug must be used carefully with full laboratory investigation, so that the blood thiocyanate level may be determined from time to time. The Americans hold that the blood level of eight to twelve milligrammes *per centum* is satisfactory. English writers assess the therapeutic level at five to eight milligrammes *per centum*. The main estimate of the therapeutic level is relief of the patient's symptoms and reduction in the blood pressure.

Toxic symptoms are as follows: lassitude, nausea, vomiting, muscular weakness, rashes, painful enlargement of the thyreoid gland associated with myxœdema, mental confusion and, when overdosage is given or an unusual degree of sensitivity to the drug exists, coma and death. One case of femoral thrombophlebitis has been reported to follow the use of thiocyanate.

The first essential is your patient's cooperation in coming for frequent examination in the early stages until a satisfactory level is achieved.

The following method of dosage is followed in the out-patient department at this hospital. Two and a half grain doses of sodium thiocyanate three times a day are prescribed for two weeks, when the blood level is estimated. If this is around 10 to 12 milligrammes *per centum*, the dose is lowered to two and a half grains twice a day for one month to six weeks; the patient is examined at fortnightly intervals and the blood level is estimated in one month. If the first blood level is about five or six milligrammes *per centum*, five grain or seven and a half grain doses per day are alternated for two weeks; if a second blood level estimation is satisfactory, five grains per day are given for four to six weeks. The blood level is again checked, and if all is well alternate doses of five grains per day and two and a half grains per day are given for four to six weeks, according to the blood concentration achieved at the end of the month. Finally, the dose is lowered to two and a half grains per day, the blood level being estimated every two or three months. This dose may have to be increased from time to time.

Some patients respond well, with striking relief of symptoms and lowering of blood pressure. Many find that they require a smaller dose of sedative.

Any intolerance must be followed by suspension of the drug.

It has been found that thiocyanate is doubly effective after sympathectomy, and this combination is often valuable when a single member of the partnership is not.

Reports of Cases.

The following are illustrative cases.

Mrs. D.T., aged forty-eight years, gave a history of septicæmia following a miscarriage sixteen years earlier and of hypertension and kidney trouble eleven years earlier. She had two living children, with a history of one premature labour at seven months and one pregnancy terminated for high blood pressure. The patient complained of the following: swelling of the hands and feet, severe headache, breathlessness even when walking on level ground, palpitation, sleeplessness, and precordial pain occasionally on exertion.

On examination, the patient was a short, obese, plethoric woman with flushed face and neck and pulsation of the vessels of the neck. The apex beat was four and a half inches from the mid-line in the sixth left intercostal space. The aortic second sound was exaggerated and the blood pressure level was 270 millimetres of mercury (systolic) and 160 millimetres (diastolic). At one time it was found to be 300 millimetres of mercury (systolic) and 160 millimetres (diastolic). An electrocardiogram suggested the presence of coronary sclerosis.

A urea concentration test showed a maximal figure of 2·6 milligrammes *per centum*.

This patient showed a great improvement with thiocyanate treatment; she gained relief from the headache, the breathlessness and the swelling of her legs with a blood level of nine milligrammes of thiocyanate per 100 millilitres of blood. Her blood pressure at this time dropped to 220 millimetres of mercury (systolic) and 120 millimetres (diastolic), and later fell to 194 millimetres of mercury (systolic) and 110 millimetres (diastolic).

Mrs. O.W., aged forty-three years, is a typical example of a patient suitable for the operation of sympathectomy, which, however, she refuses to consider. She has been attending the out-patient department since 1941, when she was thought to be suffering from thyreotoxicosis. However, when her old papers were examined, there was found to be

no increase whatever in her basal metabolic rate, which was estimated at 13%. In 1945 she came complaining of dyspnœa at night, of "a horrible bursting feeling" in the head at night, of headache and of dizziness.

On examination, the patient was a woman of healthy appearance with a rather flushed red face. Some fullness of the thyreoid gland was present. The apex beat was in the sixth left intercostal space four and a half inches from the mid-sternal line. The aortic second sound was much exaggerated, and the blood pressure readings were 240 millimetres of mercury (systolic) and 140 millimetres (diastolic). The blood urea content was 42 milligrammes *per centum*. Urea concentration tests gave the results shown in Table I. Examination of a centrifuged specimen of urine revealed occasional leucocytes and red blood cells.

TABLE I.

Time.	Urea *per Centum*.	Urine. (Millilitres.)	Specific Gravity.
Before draught ..	2·15	92	1018
One hour after ..	3·15	68	1018
Two hours after ..	3·5	50	1020

Ophthalmoscopic examination revealed arteriosclerotic changes and arteriolar nicking of the veins. The blood pressure remained at the recorded level until thiocyanates were given, when she began to feel better; the readings then fell to 190 millimetres of mercury (systolic) and 110 millimetres (diastolic). She no longer had headache or nocturnal dyspnœa, and she had lost the bursting feeling in the head.

Unfortunately this patient's thiocyanate treatment has been ignorantly suspended at intervals, and there follows the tedious work of getting her back to a satisfactory level. She always returns with a request for the drug, as it gives her so much relief. During this time her basal metabolic rate has fallen from −13% to −1%.

In October, 1947, her blood pressure was 180 millimetres of mercury (systolic) and 110 millimetres (diastolic). Two months later she was found to be pregnant, and she miscarried a few weeks later. She returned in February, 1948 (having been off sodium thiocyanate for three months), with her original symptoms and a blood pressure of 260 millimetres of mercury (systolic) and 140 millimetres (diastolic).

Reports of Cases.

AN UNUSUAL CASE OF HÆMOPERITONEUM.

By C. A. C. LEGGETT, M.B.E., M.S., F.R.A.C.S.,
Chief Assistant, Department of Surgery, University of Queensland, and Assistant Surgeon, Brisbane General Hospital.

THE most usual causes of hæmoperitoneum in the young woman are, of course, ectopic gestation, traumatized viscera or bleeding from normal or abnormal ovarian tissue. I have seen the rare case of spontaneous rupture of the spleen in a female, and on one occasion I performed laparotomy upon a young woman with a large amount of free blood in the peritoneal cavity, in whom it was impossible to show clearly the origin of the bleeding from any of the expected sites within the abdomen. This patient recovered although she was suffering also from an acute medical disease which may have been an ætiological factor in the condition. Some months later I was called to see and operate upon a second patient with hæmoperitoneum, whose history is as follows.

Clinical Record.

The patient was a healthy young married woman, aged twenty-six years and the mother of one child, aged nine months. There had been no previous illness of note. Two weeks prior to the time of consultation the patient had experienced severe pain in the hypogastrium, which did not resemble colic, but which was a continuous pain lasting some hours. After this period the pain gradually lessened in severity, but the patient stated that her abdomen remained slightly tender on pressure at one point in the hypogastrium. The following was the menstrual history. The patient usually had a twenty-seven day cycle. The last normal menstrual period began on March 4. After a thirty-two day interval the patient began what appeared to be a normal period except that it was accompanied by slightly more pain than usual. This bleeding lasted five days and there was no further bleeding or discharge *per vaginam* until the abdominal catastrophe twenty-seven days later. At 11 a.m. on the day of consultation the patient was engaged in rather vigorous exercise when she was suddenly seized with generalized abdominal pain which was continuously severe. She soon felt faint and found some difficulty in breathing, and noticed pain in the region of the right shoulder. The patient on examination presented the classical picture of intraperitoneal hæmorrhage. The cervix was slightly softened, but there were no other evidences of normal or abnormal pregnancy.

The abdomen was explored through a lower right paramedian incision and the peritoneum was found to contain a large quantity of free blood. On inspection of the pelvic organs no obvious source of blood was apparent. Closer inspection revealed a hæmorrhagic area on the left ovary, one centimetre in diameter, which it was considered might have been responsible, but the Fallopian tubes and uterus appeared normal on careful examination. A hand was then passed up to the liver, which was normal to palpation, and then an attempt was made to palpate the spleen. A mass approximately two inches in diameter was encountered in the left hypochondrium. The mass was found to be entirely confined to the greater omentum and was surrounded by much blood clot. Here was the source of the intraabdominal hæmorrhage. The greater omentum was resected, and on macroscopic examination the mass consisted of thickened omental tissue, extravasated blood and tissue resembling early placental tissue. There was no sign of an embryo. Microscopic examination showed the presence of chorionic elements with hydatidiform degeneration. Section of a wedge-shaped biopsy from the hæmorrhagic area of the left ovary showed organizing blood clot but no evidence of corpus luteal tissue. The patient remains well twelve months after the operation.

Comment.

It is considered that this patient had either an early ruptured ovarian pregnancy or an early tubal abortion. The entirely normal condition of the tubes on close inspection and the presence of the organizing blood clot in the left ovary are altogether in favour of the rare condition of a primary ovarian pregnancy. This case illustrates the remarkable powers of the omentum, which, however, in this case failed to control an active parasite which it encountered in the pelvis and carried with it to the upper part of the abdomen. Hæmoperitoneum resulting from trophoblastic activity in the upper part of the abdomen must be considered rare.

AMYLOID "TUMOUR" OF THE LARYNX REQUIRING LARYNGOFISSURE.

By G. C. HALLIDAY and R. H. BETTINGTON,
Sydney.

A MALE PATIENT, aged fifty-seven years, was admitted to the Repatriation General Hospital, Concord, on July 24, 1947. He had suffered from chronic bronchitis and pharyngitis since the 1914-1918 war. He said that he had had hoarseness of voice intermittently since an attack of acute bronchitis three years previously. There was some question of a laryngeal examination about two years prior to his admission to hospital, but no record of it was available. The patient had spasms of choking.

Examination of the patient on July 26 revealed no abnormality in the nose, throat or ears. The tonsils were small. Indirect laryngoscopic examination revealed a fleshy-looking mass with the appearance of a large pedunculated papilloma situated between the vocal cords; it appeared to be attached to the upper surface of the right cord. Direct laryngoscopic examination was recommended, with the removal of the papilloma under local anæsthesia.

On August 1 direct laryngoscopy was carried out under local anæsthesia. A papilloma was found to be attached along nearly the whole border of the right vocal cord; it extended down below the cords for an undetermined distance. A biopsy specimen was taken.

On August 4 the results of the Wassermann and Kline tests applied to the blood serum were found to be negative. The pathologist's report on the examination of the biopsy specimen was to the following effect: microscopic examination revealed that the surface epithelium was hyperkeratotic and hyperplastic, but there was no evidence of tumour formation; chronic inflammatory changes were conspicuous in the underlying connective tissue; polymorphonuclear neutrophile cells were also numerous. On August 13 indirect laryngoscopic examination revealed that a large papillomatous type of growth was still present, which was acting as a ball and socket in the larynx. It was suggested that laryngofissure was required.

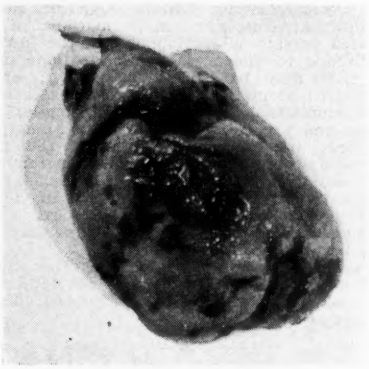

FIGURE I.
The "tumour", approximately twice natural size.

On September 12, under local anæsthesia, laryngofissure and removal of a laryngeal polypus were carried out. The papilloma was found to have its base attached to the anterior portion of the right vocal cord, and the attachment extended around the anterior commissure onto the anterior portion of the left cord. The papilloma was removed with a snare and the wound was closed in layers without drainage. After the operation the patient suffered from emphysema of the neck, and the lower wound sutures were removed, with prompt relief of the condition. On September 19 secondary suture of the laryngofissure wound was carried out. On September 24, there was a slight discharge from the lower portion of the wound; indirect laryngoscopic examination revealed perfectly clean vocal cords.

On September 26 the pathologist reported as follows. The specimen was stated to be a slightly nodular tumour measuring two centimetres in its longer diameter. Examination of the cut surface revealed a homogeneous translucent appearance. Microscopic examination showed the lesion to be lined by stratified squamous epithelium; proliferation of connective tissue associated with amyloid changes was present. Blood vessels were numerous and their walls were thickened by amyloid deposits. The condition was regarded as an amyloid "tumour" of the larynx. It was pointed out that amyloid tissue occurred sometimes in small connective tissue growths in the larynx. The final diagnosis was considered to be fibroma (amyloid "tumour") of the larynx.

On October 2 the wound was still slightly open in the lower aspect. Indirect laryngoscopic examination showed the vocal cord surface to be clean. Some thickening and scarring were present on the right side, and the line of the right cord was not so well defined as that of the left. Massage was advised for the neck muscles, with diaphragmatic breathing for two weeks to improve the voice. On October 4 the patient said that the exercises were too strenuous for him. The wound was healing well. Indirect laryngoscopic examination revealed a small ulcer still present towards the anterior commissure of the larynx on the right side.

On October 9 the patient was discharged from hospital with an apparently clean larynx and a healed wound, though the lower portion of the scar was slightly adherent. He was advised to carry out gentle breathing exercises at home and to report once a month for laryngeal examination.

Acknowledgement.

We wish to thank the chairman of the Repatriation Commission for permission to publish this report.

Reviews.

THE HISTORY AND PRINCIPLES OF ORTHOPÆDIC SURGERY.

EDGAR M. BICK in his "Source Book of Orthopædics" has written an ambitious and first-class review of the history and principles of orthopædic surgery.[1] In a charming and clear style the author discusses the art in two parts: the greater concerning the development since the nineteenth century, and the lesser describing those principles evident in the literature before that. The latter is a period study leading to the principles of modern practice, while the former is a systematized exposition of the subject components of contemporary practice. Three thousand studied references and the author's assimilation of the orthopædic *Zeitgeist* form the basis of this *magnum opus*. The book will long remain a standard reference volume for practitioners, specialists and students, and it is not too venturesome to predict that it will become what Horace feared in his own instance, but what Dr. Bick would be gratified to witness—a text-book. The birth struggles of the art are clearly described, and as in all branches of medical science, the reasons for the rise and fall of fashion make fascinating reading.

The backgrounds of contemporary views on pathology and physiology are well delineated. All surgeons will benefit from their reading of the sections on hip and spine surgery. The erudition of the author enables him to integrate the manifold historic facets into smooth expositions. Some description of recent views on the myoneural junction would be appreciated. The elders among us will not all agree with some of his enthusiasms in these respects, but even when provocative the author is stimulating.

Some criticisms are called for, however. In his preface the author regrets his inability to include all sources. Withal some omissions are notable. Australians will view unkindly the absence of reference to Betts, who contributed greatly to the study of metatarsalgia by being the first to elucidate the syndrome of interdigital neuroma of the foot, and to demonstrate its cure by operation. McElvenny is credited with being the first in this field, whereas Betts, of Adelaide, was curing the disease years before. Trumble, of Melbourne, first established in practice the principle of ischio-femoral extraarticular arthrodesis, and Bick gives the credit elsewhere. Corlette, of Sydney, gets no mention for his masterly review and knowledge of *meralgia paræsthetica*, and the cause of Dupuytren's disease of the hand. Kocher for his pioneering work in supracondylar fractures gets no mention, although due respect is paid in other regards. The revolutionary influence of Hilton's views and publication on rest and pain are not stressed enough. In the discussion on the treatment of compound fractures the astonishing statement is made that: "From Hippocrates to World War I the treatment of open fractures was the treatment of osteomyelitis which almost unavoidably supervened." This is a

[1] "Source Book of Orthopædics", by Edgar M. Bick, M.A., F.A.C.S.; Second Edition; 1948. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9″ × 6¼″, pp. 554, with few illustrations. Price: 60s.

regrettable neglect of the work of Lister, who early published numerous successful treatments of compound fractures with a technique clearly the forerunner of modern methods. Perusal of Lister's papers would give him a larger place in this orthopædic hierarchy. Although Colonna's arthroplasty for congenital dislocation of the hip is still *sub judice*, the magnificent conception could have been mentioned in this book. The life-saving influence of the Thomas knee splint in war could have been stressed. Staudinger's studies on metatarsal imprint pressures are not mentioned. Despite Bankhart's demonstration of the pathology of most cases of recurrent shoulder dislocation, the author says that the present tendency in its treatment is towards teno-suspension operations. Those who attack the problem the Bankhart way will not agree with this statement—especially as the recurrences after teno-suspension operations are appearing more often. The author discusses the orthodox-heterodox (Kenny) poliomyelitis quarrel poorly, without due regard for the principles involved. This is one of the few parts of the book where issues are not clearly presented and the author seems conscious of this. Costo-clavicular syndromes clearly merit consideration which is omitted. Eccles deserves mention in orthopædic history for his work on electric stimulation of paralysed muscles. We look forward to the next edition where each chapter might have a summary of principles gleaned from history, and where the numerous spelling errors will be corrected by more careful editing, for example, Cotugno *vice* Contugno, cuirass *vice* curass, *Spreizfuss vice Spreifuss*, Colin *vice* Collins (MacKenzie). These criticisms do not shake our opinion that the book is a *chef-d'oeuvre* and will cause all orthopædic surgeons to swell with pride in their imposing genealogy.

BONES.

"BONE AND BONES", by Weinmann and Sicher, sounds a rather dry and uninteresting book; but the authors, one an anatomist and the other a pathologist, have given it vitality and interest.[1] Further, while both are graduates in medicine, their work is in the dental schools of their respective universities, so it is strange that they have nothng to say on adamantinoma in its various sites of occurrence.

The first one-third of the book is devoted to a discussion of the normal structure and growth of bone. The rest deals with the pathology of bone in its many manifestations. The book is a storehouse of useful information, and its illustrations, which number nearly 300, are clear reproductions of the microscopic appearance of the different subjects discussed.

The book is a work of reference, and one which should be available to anyone who has need of precise information in the field of bone pathology.

THE PROBLEMS OF FAMILY LIFE.

SINCE "The Problems of Family Life", by Agatha H. Bowley, was first published in 1946, it has become widely appreciated by parents and many professional workers requiring a knowledge of child development.[2] With the addition of the new material in the second edition, which has recently appeared, this volume should prove of practical value and considerable interest to all those concerned with individual and family problems.

The data have been obtained from some of Dr. Bowley's case histories, from her work as senior psychologist to the School Psychological Service in Leicester.

In this edition more consideration is given to the discussion of normal family environment and child development and the everyday problems of parents. The previous edition concentrated rather on the more severe type of problem met with in a guidance clinic.

Dr. Bowley can always be relied upon to give practical common-sense suggestions for helping to solve the many difficulties which are likely to beset even the best parents. She fully realizes, too, how much these difficulties are accentuated by crowded living conditions, which are still creating serious problems for so many families.

The effects on family life of a mother's full-time employment are shown to have far-reaching consequences, and the problem of the tired, ailing or worried mother is of greater social significance than is generally realized.

Children's fears and habit disorders and the common behaviour problems are given wise and sympathetic consideration. The discussion of these questions is brief, and in simple non-technical language, which means that Dr. Bowley's fund of knowledge and wisdom can be appreciated by any who wish to benefit from her wide experience.

Play material for children of various ages is listed as an appendix, and a list of mothercraft books is given as well for any desiring suggestions for further reading.

ORAL AND DENTAL DISEASES.

PROFESSOR H. H. STONES in the preface of his new text-book "Oral and Dental Diseases"[1] states: "the text fully covers the course for dental students in the subject that is variously called Oral Pathology or Dental Surgery and Pathology". It is indeed a comprehensive treatise on dental and oral pathology. Particular attention is paid to the ætiology, histopathology and clinical features and a brief outline of treatment is included.

In this text-book of dental surgery and pathology much of general medical interest will be found in the chapters on the following: congenital malformations of the jaws and associated parts; maldevelopment of the jaws; injuries to the teeth due to violence; acute infections of the face and neck that may be of oral causation; abscess and cellulitis; saliva; stomatitis and allied diseases of the oral mucosa; inflammation of the maxillary sinus; periostitis, osteomyelitis and necrosis of the jaws; traumatic maxillo-facial injuries; inflammatory lesions of the mandibular joints; cysts, and oral tumours. A discussion of chronic oral sepsis and its relation to systemic disease once more points out that foci of infection may exist in various parts of the body, hence, when an infective process is suspect, it must be remembered that the original focus may be located in one of a number of different sites.

An adequate bibliography is appended after each chapter and an index of authors as well as a subject index at the end of the book. The volume is well produced. The printing and materials are excellent.

MINOR SURGERY.

"MINOR SURGERY", by R. J. McNeill Love, has reached a third edition.[2] As in previous editions, the author has been helped by a number of collaborators. The book is intended to be a guide to hospital residents and an aid to practitioners.

A point which we noticed in previous editions, namely, the muddled arrangement, has not been remedied. This fault is particularly noticeable in Chapter IX—a chapter covering 70 pages and containing an unassorted mass of material. For easy reference more chapters are necessary. Fortunately the index is adequate. Chapter I on the examination of the patient seems to be out of place in a book of this sort. The section on thrombosis and embolism needs rewriting in the light of recent work on the anticoagulants. We feel that the sections on wounds to the head and on the eye, ear, nose and throat do not come up to modern standards.

The real difficulty in a book of this sort is in the selection of material. A considerable amount of major surgery tends to be admitted (for example, the chapter on hernia) and surgeons differ in what they think should be described. The problem is made more difficult because in order to carry out many of these so-called minor procedures much surgical experience is necessary. The author has not escaped this dilemma, with the result that many younger graduates will be deceived by the apparent simplicity of some operations.

The book is well produced.

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[1] "Bone and Bones: Fundamentals of Bone Biology", by Joseph P. Weinmann, M.D., and Harry Sicher, M.D.; 1947. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9" × 6", pp. 464, with many illustrations. Price: 75s.

[2] "The Problems of Family Life: An Environmental Study", by Agatha H. Bowley, Ph.D.; Second Edition; 1948. Edinburgh: E. and S. Livingstone, Limited. 7¼" × 5¼", pp. 144, with illustrations. Price: 6s. net.

[1] "Oral and Dental Diseases: Ætiology, Histopathology, Clinical Features and Treatment", by Hubert H. Stones, M.D., M.D.S., F.D.S.R.C.S. (England); 1948. Edinburgh: E. and S. Livingstone, Limited. 9½" × 6½", pp. 918, with illustrations, some coloured. Price: 90s.

[2] "Minor Surgery", by R. J. McNeil Love, M.S. (London), F.R.C.S. (England); Third Edition; 1948. London: H. K. Lewis and Company, Limited. 7" × 4", pp. 440, with illustrations. Price: 22s. 6d.

The Medical Journal of Australia

SATURDAY, JANUARY 22, 1949.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

MOTOR-CAR CONSTRUCTION AND MOTOR TRAFFIC ACCIDENTS.

AFTER any public holiday week-end the newspapers in this country generally publish a special article in which are recorded the deaths that have attended the public enjoyment of leisure. Among these there are invariably a number that have been the result of motor-car accidents. The average reader asks himself whether nothing can be done to check the increasing number of motor-car fatalities; the cynic may express his surprise that they are not more numerous, but the seriously minded person, though willing to give time and thought to the matter, sees no way in which he can do anything. A dramatic statement on the occurrence of motor-car accidents was made by Fletcher D. Woodward at the annual session of the American Medical Association last June.[1] He quoted figures from the annual report of the National Safety Council of the United States. In the year 1946 there were 33,700 deaths in motor vehicle accidents in that country; this was an increase of 20% over the figures for 1945. Injuries from motor vehicle accidents numbered approximately 1,200,000. The costs associated with the accidents amounted to the enormous sum of 2,200,000,000 dollars. Woodward said that these figures meant that one motor vehicle death occurred every fifteen and a half minutes and one injury every twenty-six seconds. In other words, during the time that he took to present his paper, two deaths and sixty-eight injuries would have taken place in the United States. It is interesting to note Woodward's contention that there has been a substantial reduction over the years in the motor vehicle accident rate. In the early 1930's approximately sixteen persons were killed for every 100,000,000 miles of motor vehicle travel; in 1947 the number of persons killed for the same number of miles of travel was nine. It is perhaps of some comfort to know that the large number of deaths may represent a relative rather than an actual increase. As pointed out in previous discussions of the subject in these pages, it has a double interest for members of the medical profession. They have the ordinary interest of travelling members of the public and they have a professional concern with safety on the roads and the avoidance of damage to human beings. One of the ways in which the medical profession shows its concern for the prevention of accidents is in its study of accident proneness. This subject was discussed in 1942 in an "Emergency Report" issued by the Medical Research Council Industrial Health Research Board. (See THE MEDICAL JOURNAL OF AUSTRALIA, January 9, 1943.) A paragraph from an earlier report which was quoted in these columns on May 25, 1935, may with advantage be reproduced, for it sums up the condition in a satisfactory way:

> Not only are some people more prone to accidents than others exposed to the same risks, but those specially prone to accidents sustain an undue number of accidents both in the factory and out of it, and those who sustain an undue number of one kind of accident also sustain an undue number of other kinds. Accident proneness is a relatively stable quality, so that those who sustain an undue number of accidents in one period of exposure will tend to do so in other periods of exposure. Further, those who sustain an undue number of minor accidents also tend to sustain an undue number of major accidents. Thus it follows, and is in fact found, that if those who have an undue number of accidents in their first year of exposure are eliminated, the subsequent accident rate of the group is diminished.

Motor traffic accidents may be classified as due to three causes associated with the person driving the car, the structure and general engineering equipment of the vehicle, and the road on which the vehicle travels. Of course, combinations of these causes may operate. Accident proneness is one of the causes associated with the driver; others will include the age and health of the individual and his psychological condition. These headings will cover such considerations as intoxication by alcohol or other drugs, and it would almost certainly be safe to add the irritation caused by a petulant and persistent "back-seat driver". Woodward thinks that safe driving should be taught to "teen-agers" in high schools. Two million boys and girls reach driving age each year in the United States and 50% of them become drivers. In 5521 high schools out of 25,300 driver education is offered in the classroom and 545 schools offer actual instruction behind the wheel. It is not surprising to read that a study by the American Automobile Association showed that the accident rate among those who received high school training was less than among those who did not receive this training.

Woodward's address dealt chiefly with "automotive engineering", and it is to this that attention in the present instance is directed. He states that 15% of all accidents involve mechanical defects. Road safety and motor-car design were discussed in these pages on September 15, 1945, in the light of an article by two officers of the Austin Motor Company, J. F. Bramley and N. T. Glynn. These authors discussed the subject under control, stability, vision and comfort factors. Special mention was made in our discussion of the driver's seat and the bonnet of the motor-car in relation to the driver's vision of the road. Many of the points mentioned by Bramley and Glynn are also referred to by Woodward; his chief point, however, is that there is abundant evidence from air crash reports that "the adoption of construction methods and safety features now employed by the aviation industry would render it at present possible to build motor-cars capable of withstanding collisions, leaving the road at high speed and overturning, with greatly reduced likelihood of injury to their occupants, as well as reducing the likelihood of

[1] *The Journal of the American Medical Association*, October 30, 1948.

such accidents". In regard to structure it is suggested that a frame and body of welded "unit construction" would be useful and that such a structure should also include "crash struts" as found in aircraft. Windshields and windows of "a plastic material" would give added protection. While special cleaning materials and special cleaning technique would be required, Woodward points out that the use of such a material in aircraft is universal and satisfactory. Again, he holds that the front bumper should be mounted on "oleo shock absorbers" in a way similar to that used in the landing gear of aeroplanes, "which quickly and efficiently absorbs the shock of the heaviest planes on landing". Other devices with which he deals include (*a*) safety belts such as are used as standard equipment in aircraft, (*b*) a hydraulic steering column which will move forward under a force of approximately one hundred foot pounds, (*c*) crash pads—the installation of sponge rubber padding on the dash and the back of front seats to eliminate many of the present-day head injuries. These are only some of the points discussed by Woodward; the article should be studied in detail by those who are specially interested. The point that emerges is that everyone will probably agree that Woodward's ideas are sensible and his suggestions of value, but with manufacturers and salesmen vying with one another to sell motor-cars—many of them on their speed performance and their appearance—it is doubtful whether any drastic changes will be made. Woodward quotes a statement by the president of the Automobile Association in Boston that automobiles should be redesigned to stress safety rather than speed and appearance.

For the sake of completeness the third chief source of motor-car accidents—faults in road construction—must be mentioned. In our discussion on this subject in May, 1935, road construction was specially mentioned and the suggestion was made that a Motor Accident Investigation Board should be established for the searching investigation of every accident so that faults in drivers, vehicles and roads might be discovered and suitable action taken. Such an idea is just as worthy of consideration now as it was fourteen years ago. Woodward's contribution is practical and timely. He states that the only influence of aircraft design apparently so far adopted by automotive engineers is the erroneous one that the aerodynamic principles of a jet-propelled aircraft should be applied to a vehicle, the speed of which should be limited to fifty-five miles per hour on the ground. He wonders what traffic casualty incidence will be tolerated before some concerted action will be taken. Will it be two million casualties a year, or three? It would be to the everlasting credit of Australia if one of the States would lead the way and make some determined effort to deal with this problem. The members of the medical profession might well goad the governmental authorities into activity.

Current Comment.

SCHOOL ARCHITECTURE.

NOT many medical practitioners would pretend to an extensive knowledge of any form of architecture, still less of the specialized subject of school architecture, but most would feel, when they thought about it, that they should be interested in how schools are planned, designed and built. As parents, members of school boards, citizens or keepers of the public health this is very much their business. This is recognized in a book entitled "New Schools", issued by the Royal Institute of British Architects, in which it is stated simply: "Contemporary school design involves the welding into one unit of three distinct requirements, education, health, and architecture." This quotation is made in a report[1] of an exhibition arranged in London not long ago by the Royal Institute of British Architects, under the same title as the book mentioned. The report asserts that the modern conception of school architecture is as different from the older one as modern teaching methods are from those of the "dame-schools", this forming part of the newer outlook towards children which "resolves itself into the fact that children are credited with having minds of their own and with being adults in embryo who can learn from their environment". The exhibition covered the location of schools, their external and internal design and decoration, and school furniture. Significant points in location relate to transport and positions of homes and work-places; undesirable features such as railway tracks, busy roads and other sources of danger or noise; arrangements for playgrounds; provision of such essentials as water and electricity; and the need to fit in with development plans of local authorities. Vital points in school design are concerned with adequate lighting by daylight without glare, the minimizing of noise both from outside and from other parts of the school building, and safety precautions in minor as well as major details. Much stress is laid on environment, especially as a factor likely to influence the child's taste and outlook in later life. "Drabness breeds drabness, beauty breeds the desire for beauty"; the right use of colour, suitable surface finishing of walls, furniture, chalkboards *et cetera*, the right kinds of decorations, all can contribute to providing the best influence and can be used in a positive way in the school's purpose and programme. The type of school—nursery, junior, secondary, technical—will have its special requirements of design. School furniture is a subject to which perhaps not enough attention has been paid, and it is interesting to note that the British Ministry of Education has been investigating the matter and that "a long-term systematic anthropometric study" has started at the University of Birmingham "to formulate the dimensional and form requirements for furniture of all types and for all ages". Some preliminary results have already been of use in the designing of chairs for school children. Apart from this, of course, the general style of school furniture has made considerable advances, and in this field, as with all other aspects of school planning, much valuable detailed knowledge has been accumulated by the respective experts. The important point for the doctor who wishes to interest himself in this subject is that he does not need to acquire a lot of technical knowledge. The basic principles depend upon common sense applied in the light of his knowledge of physiology, hygiene and elementary child psychology. The schoolmaster knows what is required essentially; the architect is the practical expert who can translate ideas into practicalities; the doctor by a benevolent and non-meddlesome interest can help to ensure that the child receives the greatest benefit.

AN EFFECTIVE ANTIVIRAL CHEMOTHERAPEUTIC AGENT.

THE treatment of virus infections has lagged behind in recent development of therapeutic agents, and indeed no such agent specific against true animal or human viruses has been available. Some recent work reported from America by Murray Sanders, Y. SubbaRow and R. C. Alexander[2] is then of special interest. These investigators, working at the Lederle Laboratories, infected a large

[1] *The Journal of the Royal Institute of Public Health and Hygiene*, July, 1948.
[2] *Texas Reports on Biology and Medicine*, Volume VI, Fall, 1948, page 385.

series of mice by intraperitoneal inoculation with mouse poliomyelitis virus. Within twenty-four hours treatment was instituted by intraperitoneal injection with the sodium salt of a newly synthesized sulphonamide, phenosulphazole (*N*-(2-thiazolyl)-phenol sulphonamide), which also has the proprietary name of "Darvisul". There was, of course, a suitable control series. It was found that the sodium phenosulphazole was effective against as many as 100 LD50's of the virus. Mice which received treatment and survived an initial infection were relatively immune to reinfection. In two experiments more than half of the mice which received a single dose of sodium phenosulphazole by mouth were resistant to a subsequent "assault" dose of virus which killed all control animals; the survivors were immune. This prophylactic effect is considered by the investigators to be one of the most important findings of the study and is being investigated further with larger numbers of animals. In investigations into the mode of action of the drug it was found that phenosulphazole in serum ultrafiltrate tissue cultures did not act directly on the mouse virus, but appeared to derive its antiviral properties by reacting with the cellular substrate. Parahydroxybenzoic acid nullified the antiviral effect of the sulphonamide in tissue cultures. One of the most striking aspects of the work was the apparent lack of toxicity of sodium phenosulphazole for the two experimental hosts studied, mice and monkeys. The effect of the drug is now being studied in *Macacus rhesus* monkeys infected by the intracerebral route with a human strain of poliomyelitis virus. This work is being extended to include various species of monkeys and routes of infection and is to be reported in detail at a later date. The results will be awaited with considerable interest.

THE PATHOGENESIS OF THE ACUTE EXANTHEMATA.

THE lack of suitable susceptible laboratory animals has hindered the experimental investigation of the acute exanthemata—smallpox, chickenpox, measles and rubella—which are characterized by a long incubation period and by a rash which develops some days after the onset of symptoms. As a means of countering this difficulty, Frank Fenner[1] has investigated the pathogenesis of mousepox (infectious ectromelia of mice), which is caused by a virus closely related to the causal organism of one of the human acute exanthemata and is characterized by a relatively long incubation period and a rash; the results thus obtained have been compared with the data available on the pathogenesis of the human exanthemata and some interesting suggestions have been made. A large number of mice were inoculated in the pad of one hind foot with a small dose of ectromelia virus, a procedure which closely resembles natural infection. From a subsequent detailed study of the mice the following hypothesis was formed of the pathogenesis of the disease. Infection with ectromelia virus takes place by the introduction of a few virus particles into the skin of the mouse either naturally through an abrasion or by inoculation. Within eight hours of the establishment of infection virus passes to the regional lymph gland, within which it multiplies for a few days. Necrosis of cells in the lymph gland next liberates virus, which enters the blood-stream, but is immediately taken up by the phagocytes of the liver and spleen and possibly the bone marrow. Contiguous cells of these organs are infected, with a great increase in the concentration of virus. Virus particles are next liberated directly into the blood-stream by necrosis of the infected cells lining the sinusoids of those organs. This secondary viræmia, which is first evident on the fourth day after infection, leads to widespread focal infection of the epidermal cells, virus being first detected in the skin on the sixth day. By this time the titre of virus in the primary lesion has reached a high level, and for the first time there is obvious œdema at the site of entry of the virus, and the incubation period has come to an end. The œdema at the site of entry increases, ulceration follows, and the mouse liberates virus into the environment—that is, it is infective. Virus deposited in the skin as a result of the secondary viræmia multiplies for several days before any macroscopic lesions appear. Clinical recovery and the disappearance of virus are closely correlated with the appearance of circulating antibody.

Fenner then compares the principal features of mousepox with those of various other exanthemata, and suggests that his interpretation of the pathogenesis of mousepox provides a good explanation of the known facts in smallpox, chickenpox and measles; and further that the concept of a primary lesion (which may or may not be clinically apparent), an internal focus of multiplication, and a secondary liberation of the virus or bacterium into the blood-stream, with production of focal lesions in the skin and elsewhere, may prove useful in studies of the pathogenesis of many human diseases. Certain of the observed features of the exanthemata correspond well with the hypothesis enunciated. First, the long incubation period of the natural diseases, and the shorter incubation period of the same diseases after intravenous inoculation, and of dengue, can be explained by the time necessary for the proliferation of virus in the primary lesion, in the regional lymph gland and in the internal focus in the natural disease, and the elimination of the first two stages when intravenous inoculation is the mode of infection. Fenner points out that differences in the reproduction rates of different viruses and in different tissues are also important in this connexion. Secondly, the delay of several days between the onset of symptoms and the appearance of the rash is due to the fact that symptoms ensue when multiplication in the primary focus or in the internal organs reaches a high level, whereas infection of the epidermal cells during the consequent secondary viræmia takes place at just about the time of the onset of symptoms; multiplication of the virus in the skin must then proceed for a few days before lesions become evident. Thirdly, the long period of the secondary viræmia provides the massive and universal distribution of virus which leads to the very durable immunity produced by these diseases. In conclusion, Fenner points out that the conventional description of the period of the onset of symptoms in smallpox and measles as the "stage of invasion" is erroneous, for the blood-stream and the organs are invaded during the incubation period before symptoms arise. Altogether this work of Fenner's provides much food for thought. His account of the investigation of mousepox, which was carried out at the Walter and Eliza Hall Institute of Medical Research in Melbourne, indicates work that was painstaking and imaginative; his conclusions and suggestions, which are not intended to be dogmatic and final, open up useful avenues in the study of living pathology.

[1] *The Lancet*, December 11, 1948.

AUREOMYCIN IN OCULAR INFECTIONS.

ALSON BRALEY AND MURRAY SANDERS have presented a preliminary and interesting report on the use of aureomycin in ocular infections.[1] Aureomycin is an antibiotic derived from a mould belonging to the Streptomyces group. In most cases the antibiotic was administered locally as a 0·5% solution of a borate salt. Of the patients treated 56 had a staphylococcal conjunctivitis; most had associated blepharitis and many had superficial punctate keratitis. In the majority of cases healing was complete within the first twelve to twenty-four hours. Four patients with influenzal conjunctivitis responded rapidly, as did five with pneumococcal and two with inclusion conjunctivitis. The antibiotic has no effect on the course of established epidemic keratoconjunctivitis, although when treatment was instigated within the first three days after the onset of symptoms the response was good. The effect of aureomycin in the treatment of dendritic ulceration is inconclusive and in vernal conjunctivitis the patients claimed subjective relief while the antibiotic was being used. Nine patients with acute follicular conjunctivitis of unknown cause responded satisfactorily to treatment.

[1] *The Journal of the American Medical Association*, October 9, 1948.

Abstracts from Medical Literature.

PATHOLOGY.

Alloxan and Pancreatic Islet Cells in Man.

JEROME W. CONN (*The American Journal of Pathology*, March, 1948) has studied the sensitivity of normal human islet tissue to the destructive effects of alloxan which was found to approximate that observed in other species. Neoplastic islet tissue is much more resistant to the injurious effects of alloxan than is normal islet tissue. This suggests that certain metabolic processes within the abnormal cells differ significantly from those which exist in normal islet cells. The development of persistent *diabetes mellitus* following surgical removal of the uninjured islet cell neoplasm confirms functionally the severe structural lesion observed in the islets of the pancreas proper and the absence of structural alterations in the tumour cells. In future attempts to use alloxan therapeutically the above facts should be considered. It is believed that the amount of alloxan required to produce the desired effect upon islet cell neoplasms is likely to be lethal to the patient. The α and δ cells of human islet tissue are susceptible to damage by alloxan, but to a much lesser degree than are β cells. Hyperplasia of α and δ cells appears to be one response to alloxan injury of the islets of Langerhans. In this case the evidence is good that the islet cell tumour had its origin in pancreatic duct epithelium.

Spread of Carcinoma to the Spleen.

ACCORDING to John W. Harman and Paulo Dacorso (*Archives of Pathology*, February, 1948), in thirty cases of carcinoma in which metastases occurred in one or more organs in more than one body cavity, the incidence of splenic and pancreatic metastases was 50% and 43% respectively. The low occurrence of splenic metastases as compared with those observed in lymph nodes, liver and lungs was due to inequality of exposure to metastases. When exposure was equalized, the spleen was not less susceptible than other viscera.

Histopathology of Virus Encephalomyelitis.

A STUDY of cases of Japanese, or type *B*, epidemic encephalitis, poliomyelitis and Vienna, or type *A*, epidemic encephalitis (von Economo's lethargic encephalitis) by I. Mark Scheinker (*Archives of Pathology*, March, 1948) discloses the following characteristic histopathological changes common to various types of virus encephalitis. The morbid process is characterized by primary involvement of nerve cells of the grey matter of the brain and of the spinal cord, with relative sparing of the white substance. The destructive alterations of the nerve cells are predominantly focal in character and are accompanied by focal proliferation of microglia cells, with formation of characteristic glial nodules. The distribution and the severity of the inflammatory changes do not correspond with the distribution and the degree of the neuronal damage. There is no direct parallelism between the degenerative and the inflammatory lesions. The differentiation among various types of virus encephalitis, from the histopathological point of view, must be based on the distribution of the lesions. In cases of Japanese *B* encephalitis the structures most severely affected are the cerebral cortex, the thalamus and the *substantia nigra*. The lesions of the pons, the cerebellum and the basal ganglia are discrete and not constant. The cerebral cortex is often spared. The pathological process produced in lethargic encephalitis is most intense throughout the basal ganglia and the *substantia nigra*. Whereas discrete focal lesions may be observed within the midbrain and the pons, they are, as a rule, absent from the cerebral cortex, the cerebellum and the spinal cord.

Intracellular Inclusion Bodies in Mild Disease of the Respiratory Tract.

ACCORDING to Camillo de Berardinis (*Archives of Pathology*, March, 1948) histological studies of the pharyngeal mucous membrane during mild infections of the respiratory tract confirm previous observations as to the presence of cytoplasmic inclusion bodies and a mononuclear cell exudate during the early stage in the majority of cases. Inclusions were also found in 12% of smears of material from normal pharynxes. The significance of the presence of the bodies is not certain, but they are generally believed to represent injury of the cytoplasm caused by a filtrable virus or other irritant. To this extent their presence adds more evidence to favour the viral origin of these undifferentiated infections. It is questionable whether the later appearance of the polymorphonuclear cell exudate and bacteria always indicates bacterial invasion rather than the non-specific reaction to inflammation and the provision of conditions favourable to bacterial growth. The regular increase in the number of bacteria present is cited by many to justify the use of sulphonamide compounds or of antibiotics in the treatment of the condition or to prevent metastatic invasion elsewhere. In view of the imperfect knowledge of the matter, the value of such therapy is highly uncertain.

The Nature of Anæmia in Leuchæmia.

ACCORDING to Douglas H. Collins (*The Journal of Pathology and Bacteriology*, January, 1948), both the incidence and the severity of leuchæmic anæmia are found to be highest in acute leuchæmia and higher in chronic lymphatic than in chronic myelogenous leuchæmia at the time of first diagnosis. Nucleated red cells are less frequently present in the blood in chronic lymphatic leuchæmia than in the other types of the disease, and severe grades of anæmia in this condition appear to be due mainly to lymphocytic infiltration of the bone marrow with hypoplasia of the erythron. In both chronic and acute myelogenous leuchæmia there is evidence of stimulated and abnormal activity of red-cell-forming tissue. In some cases this may antedate other manifestations of leuchæmia by a long interval of time. Peculiar signs of disordered erythropoiesis are seen in cases of erythroleuchæmia on the one hand and leuchanæmia on the other. Blood loss and excessive red-cell destruction may operate in some cases to aggravate the anæmia, but its essential nature appears to be, in lymphatic leuchæmia, hypoplasia of the erythron, and in myelogenous leuchæmia, defective production of cells from a hyperplastic marrow. The incidence and severity of anæmia in fifty cases of leuchæmia at the time of first diagnosis have been analysed and five illustrative cases of particular interest are recorded by the authors.

The Intramural Extension of Carcinoma of the Colon.

ACCORDING to William A. Black and John M. Waugh (*Surgery, Gynecology and Obstetrics*, October, 1948), in carcinoma of the colon the raised edge of the lesion may not mark the limit of intramural extension. There is no appreciable difference in intramural spread of carcinoma above or below the lesion. Intramural spread of carcinoma is greater in the descending colon than in other sites in the left portion of the colon. The plane of greatest extension in the bowel wall is the submucosa. The grade of malignancy (Broders's method) of the lesion has no relation to the degree of intramural spread. Spread of carcinoma through the bowel wall appears to follow the course of the intramural lymphatics. Spread of carcinoma to the extramural lymphatics occurs before the entire bowel wall is penetrated. For resections of the left part of the colon for carcinoma, only two centimetres of normal bowel need be allowed above and below the lesion in order to remove the whole of the primary lesion.

Melanin-Forming Epidermal Tumours of the Skin.

M. J. STEWART AND GEORGIANA M. BONSER (*The Journal of Pathology and Bacteriology*, January, 1948) describe a series of 57 epidermal pigment-forming tumours of the skin in man. They are classified as squamous papillomata (21), benign calcified epitheliomata (2), basal-cell carcinomata (28) and squamous carcinomata (6). These tumours have nothing in common with the malignant melanoma of the skin or its benign counterpart, except that they are pigment-forming. Clinically they behave like the corresponding non-melanin-forming epidermal tumours, being simple, locally malignant or frankly malignant as the case may be. The literature has been scrutinized for descriptions of similar tumours and the results have been analysed. Six examples are described of melanin formation in epidermal tumours induced by painting the skin of the mouse with 3:4-benzpyrene.

A New Mycobacterial Infection in Man.

P. MACCALLUM, JEAN C. TOLHURST, GLEN BUCKLE AND H. A. SISSONS (*The Journal of Pathology and Bacteriology*, January, 1948) describe a series of six cases of ulceration of the skin occurring in a rural area in Australia, in which a mycobacterium hitherto unrecorded and pathogenic to man was found in the lesions. The lesions are described, the relevant clinical data are recorded, and an account is given of the laboratory investigations which have been carried out. In the three cases in which detailed laboratory studies were made, material from the ulcers infected rats and mice but not guinea-pigs. In rats characteristic lesions were produced, including ascites, cutaneous œdema and ulceration, and the disease was transferable from rat

to rat indefinitely. The organism, a strongly acid-fast mycobacterium, has been cultivated and its characteristics are described. It requires a temperature below 37° and above 25° C. for its growth (optimum about 33° C.), and in its nutritive requirements it is fastidious to a degree comparable with the tubercle bacillus. The relationship of this disease to other mycobacterial infections is discussed, and the authors conclude that the causal organism is distinct from any of the hitherto described mycobacteria. Comment is made on certain implications of finding a new mycobacterium pathogenic for man.

MORPHOLOGY.

Supinator and Deep Radial Nerve.

F. DAVIES AND M. LAIRD (*The Anatomical Record*, June, 1948) dissected 21 upper limbs to determine the precise relationship of the deep radial nerve to both the radius and the supinator muscle. They state that the superficial and deep layers of the supinator muscle are usually separated at their insertions on the radius by an area of bone devoid of muscular attachment. The size and disposition of this bare area depend on the extent of insertion of the deep layer of the muscle. The deep radial nerve may be in contact with the distal part of the bare area if the latter is well developed and extends on to the posterior surface of the radius. It is probable that in fractures of this part of the radius, the deep radial nerve would be more prone to involvement in those cases in which it lies in direct contact with the bone.

Headform and Human Evolution.

A. A. ABBIE (*Journal of Anatomy*, July, 1947) has investigated the problem of headform in relation to evolution, race, jaw development, heredity and environment, internal form and capacity, stature, sex, and individual development. Data on the Australian aborigines were employed as a check on as many aspects of the investigation as possible. The evolutionary record shows a progressive increase in mean stature together with a progressive rise in mean cephalic index. Headform is a feature of race only because isolated groups, inbreeding for long periods, attain stable and characteristic means. There is no significant correlation between headform and size of jaws in either sex. However, the rounder-headed female is significantly more prognathous than the male, and this is a secondary sexual character. Headform is probably determined by so many independent variables that solution on simple Mendelian lines is very difficult. Since stable forms are preserved by isolated groups, however, hereditary transmission must play a part in maintaining them. The available evidence suggests strongly that change to a more favourable environment tends to bring all indices to a common mean of 80 to 82. The endocranial index is usually higher than the ectocranial, particularly in long skulls, but the difference practically disappears over a range of 79 to 82. Brachycephaly is found to be of two kinds: primary brachycephaly—characteristic of infants, dwarfs and females—is an expression of incomplete differentiation; secondary brachycephaly—associated with increasing stature—reflects the trend of human evolution as a whole. Cranial evolution is not tending towards a high degree of brachycephaly as such. The trend is more and more to preserve the fœtal mean index of 78 to 82, and this in itself is sufficient to raise the whole human mean. This trend is not an example of "fœtalization" *per se*, but reflects an evolutionary urge towards the form of head which seems to offer the greatest capacity at the minimum cost.

Human Cardiac Conducting System.

W. A. STOTLER AND R. A. MCMAHON (*Journal of Comparative Neurology*, October, 1947) give an account of studies on the innervation and structure of the conducting system of the human heart. The structural elements in the sino-atrial and atrio-ventricular nodes consist of elongated cells of small diameter surrounded by a reticular zone of large anastomosing fibres. Zones of transition to ordinary cardiac muscle contain the large Purkinje-type elements. The nodes receive an exceedingly rich nerve supply. Nerves are also present in great number in the atrio-ventricular bundle and the proximal third of its branches. The motor innervation of the heart is confined to elements of the conducting system which intervene between the nerves and the ordinary cardiac muscle. The transitional elements of the conducting system which radiate from the sino-atrial node into the musculature of the atrium carry their innervation with them, losing their nerve supply just before their transition into ordinary cardiac musculature. The same condition holds true for the atrio-ventricular node, the bundle and branches derived from it retaining their innervation for some distance into the ventricle. The terminations of the nerves in the walls of the atria and ventricles proper are on the blood vessels. The relationship of the several components of the conducting system with the cardiac musculature is best explained in terms of this nerve supply. The mode of termination of the nerve fibres on the muscular elements of the conducting system varies from simple endings of individual, fine varicose fibres to complex reticular formations. The conductive tissue of the heart appears to have retained the primitive protoplasmic functions of irritability, conductivity and contractility to a remarkable degree. A subendocardial nerve plexus of presumed sensory function is described.

The Inguinal Ligament.

H. F. LUNN (*Journal of Anatomy*, April, 1948) reports an investigation of the inguinal region in a series of vertebrates to see whether any basic principles could be found which would assist in the understanding of this region and in the dispersal of any doubts and errors that may exist. He makes special reference to the attachments of the abdominal muscles and to fascial condensations which merit description as distinct structures, and also refers to previous descriptions of the inguinal ligament and the principles that underlie its formation. An inguinal ligament was found to be a constant feature of mammalian anatomy, but the external oblique aponeurosis, although a major component of the inguinal ligament in man, is of variable importance in other forms. A fibro-tendinous arch over the ilio-psoas muscle and the femoral vessels is a constant basic component of the inguinal ligament in all animals with hind limbs. The current description of the inguinal ligament in man is not compatible with the basic principles found to underlie the structure of the mammalian groin. The description of the inguinal region given by Anson and McVay (1940) is corroborated.

Innervation of Blood Vessels.

J. W. MILLEN (*Journal of Anatomy*, April, 1948) has studied the innervation of small blood vessels by the intravital methylene blue staining method. He states that the nerves supplying the small arteries form plexuses: (*a*) in the *tunica adventitia*, consisting of finely medullated and non-medullated fibres having mainly a direction parallel to the long axis of the vessel; (*b*) between the *tunica adventitia* and *tunica media*, a meshwork of fine fibres; (*c*) in the *tunica media*, a plexus of very fine beaded fibres. The arterioles are accompanied by a small number of nerve fibres, usually two or three, which in the larger arterioles may be placed on either side of the vessel with transverse intercommunications. In the precapillaries only one fibre may be present, passing at intervals from one side of the vessel to the other. The capillaries are accompanied by very fine beaded fibres running close to the vessels or, it may be, at some little distance from them. Medullated fibres are found ending among the fat cells that lie in close proximity to the vessels. Endings of an organized type are found in the *tunica adventitia* of the small arteries. It is suggested that the plexus lying immediately external to the *tunica media* may possibly subserve the sensation of pain and may also provide a mechanism for the production of active vasodilatation. Methylene blue, in concentrations greater than those required to stain nerve fibres specifically, frequently stains other tissues in addition. A classification of small blood vessels is suggested based on their innervation.

Regeneration of Skull Bones.

G. H. BOURNE (*Journal of Anatomy*, April, 1948) states that within twenty-four hours of injury to a bone, cells of which the nucleus gives a strong phosphatase reaction, and which are probably polymorphonuclear leucocytes, accumulate in the injured area and in the periosteum and endosteum near it. Proximity to the injured area appears to accentuate the phosphatase reaction in these cells. By three or four days after injury there are very few of these cells left in the injured area, and they have almost completely disappeared after one week. Numerous osteogenetic and endothelial cells, both of which give a phosphatase reaction, are present in the injured area within three days of the injury. Macrophages, which give no phosphatase reaction, are present in large numbers in the injured area four days after injury. The number of all varieties of cells present in the injured area after four days is greatly reduced by a scorbutic diet. The healing process in the skull is very much slower than in the femur. A small hole bored in the femur of a guinea-pig on a normal diet is completely filled with bony trabeculæ at the end of one week. In the skull only a few trabecular strands are present at the end of two weeks.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on November 18, 1948, at Broughton Hall Psychiatric Clinic, Leichhardt. The meeting took the form of a series of clinical demonstrations and was arranged by DR. GUY LAWRENCE, the medical superintendent of the clinic. Part of this report appeared in the issue of January 8, 1949.

Paraphrenia.

A female patient, aged forty-four years, one of eight children, had had convulsive seizures until the age of nine years, when she first attended school. She had constant trouble with her mother until she left home at the age of twenty-seven years, but was very much attached to her father. She loved babies, and all her life had acted as a children's nurse. She had delusions that she was regarded as a bad woman and that there was some influence about her which caused men to look at her queerly and then try to seduce her—an event which she always managed to avoid. She had auditory hallucinations, which could be elicited at times, but she was on guard about them. She misinterpreted all the actions of those about her as being of a sexual type, and her life was spent in fantasy avoiding the fancied dangers. She talked soundly enough about other matters. Her condition was considered to be amorous paraphrenia, in which the mechanism was one of projection of her own unsatisfied and libidinous wishes on to males who happened to be about. The outlook was poor after all the years of mental illness.

The next patient, a married woman, aged fifty-five years, had been a healthy child and an average scholar with a satisfactory home life. She married at the age of twenty-eight years and had first a stillborn child and then twins. She later became separated from her husband because he ceased to love her. In 1942 she allowed her son to go the war and began to worry; she developed delusions that her ex-husband had the house watched and was trying to do away with her. She became depressed, cried a lot and saw visions of men in the house. Her condition was diagnosed as paraphrenia due to an unsatisfactory marital situation. In 1943 she developed delusions that Communists were annoying her at her ex-husband's orders. She was very suspicious and lacked insight. These delusions of persecution persisted and increased, and in 1948, when she suffered abdominal pain, she thought that she was being poisoned. She then began to suffer hallucinations, and stated that she heard voices.

The comment was made that paraphrenia was erected on a basis of homosexuality. That was repugnant to all, and especially to those of homosexual tendencies themselves. They repressed the idea, and if the repression failed, the conflict asserted itself in delusional guise. The answer to the question why repressed homosexuality should occur only in middle life involved the consideration of the theory of sexual evolution; but it might be briefly stated that the sexual drive had a number of components which varied in their relative intensity in different people. The heterosexual component was apt to be discharged and to some extent exhausted in married life, and it was probable that when its initial force was relatively depressed the homosexual element was able to gain expression.

Conversion Hysteria.

The first patient presented of a group suffering from conversion hysteria was a married woman, aged forty years, whose sister had committed suicide. The patient had married at the age of twenty-one years in order to leave home, as her parents drank too much alcohol. She did not love her husband, and her marriage relations were unhappy. She had been going to work for most of her married life. She suffered from recurrent attacks of aphonia, weakness about the shoulders, pain in the neck, a feeling of pressure in the head, and a painful spongy sensation in her palate; no organic cause could be found for any of these symptoms. She was sexually dissatisfied and tended to blame previously used contraceptive methods, particularly a small round sponge. The comment was made that this was a case of conversion hysteria in an unsatisfied woman, the symptoms being in the form of paræsthesia. The condition of the palate was thought to be related to her attitude towards the contraceptive used. There was remorse over the lost opportunities of the earlier days, and the patient blamed the onset of the menopause for all her troubles. The aphonia was regarded as being purely functional.

The next patient was an unmarried female social worker, aged thirty-six years. Her father had died when she was aged seventeen years; her mother was a martinet with very narrow views on religion and sex, and the patient had only recently been enlightened about the physiological facts of life. The mother had always dominated the patient, who was the eldest of four children; the three siblings had broken the fetters and were married. The patient had not done well at school and had had to go to work when her father died, mainly to help her mother, whom she disliked. She had later taken up social work and gave discourses on social matters to the employees of a large department store, even giving a lecture on sex, about which she knew little; on the other hand, whenever sex matters arose in groups or classes, she withdrew and was silent. A friend (a married man) decided that she should be informed more fully on the topic of sex, and gave her six private coaching talks on the subject, which were apparently brutally frank. There was never any question of impropriety, and all was above board. The patient respected the friend and liked him as a man, but suffered severe mental shock at the grossness of the disclosures. She developed the feeling that there was a hard lump in her chest, difficulty in breathing and preoccupation with the sex ideas which had been given to her. She looked too well and was too happy, which caused comment. She developed pain in her left arm and neck, tachycardia and palpitation, and was unable to carry on at work; an electrocardiogram revealed no abnormality. She became rather confused, exhausted and unable to sleep. At the time of the meeting she was quite at ease, talked freely of things usually not mentioned and showed a calm indifference to sex matters. She said that she would not know sex feelings if she had them, and was apparently frigid and inaccessible. Her present complaints were palpitation, tachycardia, a choking feeling in the throat and difficulty in swallowing at times. She had pain in the left side of the chest and the left arm, and in the groins and sacral regions. At times she felt as if there was no floor, and said that she did not know where she was placing her feet, so that her walking was not secure. She had had faint turns when men were about. The comment was made that her condition was one of conversion hysteria associated with an inadequate, immature and childish personality. Her symptoms gratified her by attracting attention. She felt important. She liked talking about sexual matters, and was quite unemotional. Her pains were like those generally connected with the breasts and ovaries. She was quite at home in hospital, and was actively interested in ward life.

The third patient in this group was a married woman, aged forty-three years, who was living apart from her husband. She had four children. She was an only child, who had had a reasonably good upbringing and trained as a nurse. She married for love at the age of twenty-three years a man aged thirty-six years. She was left a good sum of money, and her husband would not work while she would keep him. However, they kept together, and despite her intense dislike of sexual intercourse they had four children. Ever since the death of her mother five years previously the patient had been in trouble. She was too weary to comb her hair, and complained that her eyesight (which was normal) would not allow her to see. Her legs began to weaken and she stumbled. She claimed that she had "leg chorea", because she had seen both her aunt and grandmother who had suffered from chorea. Physically she was thin and rather wrinkled, and looked her full age. No systemic disease could be found. Her symptoms were considered to be hysterical manifestations in a woman whose husband had not come up to expectations. The husband had gone to Perth and she had decided not to follow him. The illness, taking the form of weakness of the legs, prevented her from doing so, and she gained the absence of a useless husband and kept her self-respect. It was pointed out that the hysterical person flew to illness to avoid a painful environmental situation, and the symptoms were often more trouble than reality would be; it was a poor method of solving a conflict. The nature of the patient's symptoms was probably conditioned by the illnesses observed in her elderly relatives. For treatment she was receiving electroconvulsive therapy with explanatory talks, rest and tonics.

Pseudocyesis.

A married woman, aged forty years, was shown, who was considered to be suffering from pseudocyesis. She had a long history of epileptic fits, had had a nervous breakdown at the age of seventeen years, and was still regarded as mentally immature. She had undergone hysterectomy at

the age of thirty-two years, and married three years later. Normal sexual intercourse was not achieved. She claimed that her abdomen swelled greatly, as if she might have a full-term pregnancy, and was then suddenly deflated, sometimes two or three times daily. Three weeks before her admission to hospital she began to stutter on an occasion when her husband had been very alcoholic, and her abdomen assumed vast proportions. Her mental condition had been deteriorating slowly for some time when she was admitted to hospital in a state of malnutrition. It was pointed out that pseudocyesis could be caused by a very great desire to have a child or by very great fear of having one. The patient shown, like her mother, had strange and ignorant ideas about pregnancy. She would have liked a child.

Obsessional States.

A male dental student, aged twenty-two years, was an illegitimate child brought up by foster-parents, who lavished care on him. As a boy he was healthy and a good scholar, but when at high school he got into bad company. At the age of fifteen years he had a prolonged affair with a Greek girl, and was finally chased out of town by her father with a large knife. He was then brought to Sydney, but refused to study and went with girls of bad reputation. From then onwards the foster-parents could do no good with him. He went to Canada with the Royal Australian Air Force as a wireless air-gunner, crashed in the snow and was burnt on the hands, which became infected. He returned to Australia, having seen no war action. He decided to take a dental course as a means of rehabilitation, and was preparing to matriculate, but found that he could not concentrate. His memory became unsatisfactory, he grew restless, and he went to work on a poultry farm. Seven months before his admission to hospital he developed an obsession that he had dirt and germs on him, and he began to wash his hands, body and legs. The hand-washing mania became fully developed, and he was unable to concentrate, to think or to work because of this overwhelming fear. In hospital he was apathetic and dull, had suicidal tendencies and showed evidence of his obsession regarding dirt. He said that he was seeking a good girl by whom he might have a large family. He had a violent temper. It was pointed out that there were three important factors in the development of this man's condition, which was that of a compulsion neurosis: poor heredity (his father was a scamp), the hand infection sustained in Canada and his contact with dirt on the poultry farm.

A coal miner, aged thirty-seven years, had lost his parents when he was aged ten years and had been brought up by his uncle. He had worked in a coal mine since the age of fourteen years. He got on well with his only sister, and had the reputation of being a cheerful, light-hearted person, to whom life was a game. At the age of twenty-one years he married; he had one child, aged sixteen years, but practised *coitus interruptus* for years. He was a good husband and a kind father. He became worried over a series of unfortunate and unhappy incidents, and also some domestic trouble not of his own making. Then he developed the thought that he might commit a murder, and although he knew that he would not do so, the thought made him restless, sleepless and unsettled. He did not enjoy food and talked incessantly about himself. On his admission to hospital he was garrulous and talked of murdering people whom he said he would never kill. His speech was too rapid, and the ideas were irrelevant. He was treated fourteen times with electroconvulsive therapy, and had also had a course of continued narcosis with "Somnifaine". Despite that he had not yet relaxed. He was still very introspective and concerned about his health. He felt weak and was anxious to discuss his condition at length. The diagnosis was made of an obsessive state. He had a compelling thought and also great anxiety which he projected on to his head and body. The anxiety had been caused by years of *coitus interruptus*, the worst of all contraceptive methods. As a consequence he became an easy prey to the obsessive murder idea.

A male clerk, aged forty-nine years, had been a healthy boy with a very strict home life. An only son, he was very attached to his mother and two sisters, and took over the responsibility of the sisters and their home when the father and mother died. He did not marry, because a wife might not get on with the sisters, and kept away from women. He liked music and was reasonably sociable. For five and a half years he was a paymaster with the forces in Australia. He was pedantic and led a routine life. In 1928, after tooth extraction, he became "jittery" and was in a private hospital for two months. Since then he had had a compulsion to wash his hands often and to shake and wash his clothes, but had been able to control these urges most of the time. Recently the compulsion had grown stronger, and he became anxious if prevented from engaging in his cleansing activities. He could not work because of lack of attention, poor concentration and inability to free his mind of the contamination idea. He was given a course of electroconvulsive therapy (fifteen treatments) and calmed down a good deal. He talked freely of the bad times when he was so afraid of dirt, but was still over-clean in his ways and over-orderly. He was able to assist in the hospital record room. It was considered that the patient was suffering from obsessive compulsion neurosis, and as the symptoms had been manifest since 1928, it was unlikely that he would be cured.

A female clerk, aged twenty-eight years, was brought up by an aunt and sister, her mother having died at her birth. From the ages of eight to seventeen years she was boarded in a convent, then attended business college, and for ten years had been a clerk. She had a boy friend, was keen to marry and was a good social mixer. During the last year she had become a dawdler; she took a very long time to do anything, and in particular took two hours to have a bath; she continually washed and scrubbed her hand with a nail-brush; she washed and rewashed her clothes and carried soap in her pocket. She became very depressed at times and cried. She was afraid that the walls would fall on her, and had an idea that her nose was always dripping on her clothes. She had dreadful thoughts of the devil, and was excessively careful of her religious observances. She had suicidal wishes, but said that her religion prevented her from carrying them out. She had undergone partial thyreoidectomy not long previously. She was easily upset, and feared that she might give others some illness. The fear of transmitting or receiving dirt or infection showed itself in many ways. The dirt-avoiding ideas had been present since the age of ten years, and the hand-washing for four years. The various fears *et cetera* slowed up her life so much that she could not carry on.

(To be continued.)

NEW SOUTH WALES BRANCH NEWS.

DR. F. W. CLEMENTS, Director of the Australian Institute of Anatomy, Canberra, will address the Section of Sociological Medicine of the New South Wales Branch of the British Medical Association at 8.30 p.m. on Wednesday, February 16, 1949, in the William H. Crago Council Chamber, 135 Macquarie Street, Sydney, on "Freedom from Want: Its Biological and Political Implications". All those interested are invited to attend.

Correspondence.

INDUCTION OF LABOUR.

SIR: There have been several articles and letters in the journal lately dealing with the subject of induction of labour. None of these have mentioned the use of quinine, which I have found invaluable during the past fifteen years.

I have always used a combined medical and surgical induction with almost 100% success. I analysed 75 consecutive cases, and found that the average time from the rupture of the membranes to the birth of the child was eight hours; in only nine patients was the time more than twelve hours. The shortest time was two hours and the longest seventy-two hours. There were 57 *multiparæ* and 18 *primiparæ* in the series, and three babies were stillborn. Two of these were dead before labour commenced, one mother having diabetes, and the other was a syphilitic aboriginal who had not had any antenatal treatment. The child who died during labour was born after seventy-two hours. The mother had a contracted pelvis and a rigid cervix. She had had two live and two stillborn children previously, and a Cæsarean section would have been the proper treatment. Sixteen patients had an induction for albuminuria and high blood pressure and four had lost previous babies with ante-partum hæmorrhage. The others were all induced at 36 to 42 weeks because of the large size of the baby or because the mother was very tired at term and the child was fully developed.

The method used is as follows: 6 a.m., *Oleum Ricini* one ounce; 7 a.m., quinine sulphate ten grains; 8 a.m., enema; 9 a.m., membranes ruptured with a steel knitting needle and quinine sulphate ten grains administered; 11 a.m., if regular pains have not set in another ten grain dose of quinine is given.

I have only twice had to give an anæsthetic to nervous primiparous patients, and the babies have not given any trouble except in the case already described. Sixteen of the mothers had one or more stillbirths and most of them had a history of prolonged labours. Forceps were only used three times in the series.

Yours, etc.,

137 Faulkner Street, Armidale, New South Wales. ELLEN M. KENT HUGHES.

December 27, 1948.

SPIRITS AS A DISINFECTANT.

SIR: *Re* the article of "Lister" in the journal of December 25, 1948, regarding live organisms in museum specimens kept in spirits and condemning the use of methylated spirit or rectified spirit as a disinfectant for surgical ware, especially syringes, I would reply by saying: "By their fruits ye shall know them." In the last twenty-six years I have always kept my syringes in methylated spirit, and during that time I have used the hypodermic needle twice daily for insulin injections (18,980 times) without a single reaction of any kind. Surely a good test of its efficacy.

Yours, etc.,

Melbourne, December 28, 1948. "METHYLATED SPIRIT".

A NATIONAL MEDICAL SERVICE.

SIR: Dr. L. J. A. Parr in his recent letter admirably draws attention to many problems which the Government should consider are of vital importance to the community.

Tuberculosis particularly calls for immediate survey. Most general medical practitioners from time to time diagnose early and well-established cases of this disease, only to see the former's chance of arrest completely lost and the latter at times die in their homes whilst awaiting hospital admission.

The Government could convince both the public and the medical profession that it is really sincere in its proposals to improve the medical service of the community by dealing in some practical way with the sufferers from chronic ailments who at present receive little or no attention at all.

Yours, etc.,

30 Belmore Street, Burwood, New South Wales. A. W. METCALF.

January 7, 1949.

Research.

THE ELLA SACHS PLOTZ FOUNDATION FOR THE ADVANCEMENT OF SCIENTIFIC INVESTIGATION.

DURING the twenty-fifth year of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation, twenty-six applications for grants were received by the trustees, fifteen of which came from the United States, the other eleven from seven different countries in Europe and Asia. Fifteen grants were made. In the twenty-five years of its existence the Foundation has made six hundred and two grants which have been distributed to scientists throughout the world.

In their first statement regarding the purposes for which the fund would be used, the trustees expressed themselves as follows:

1. For the present, researches will be favoured that are directed towards the solution of problems in medicine and surgery or in branches of science bearing on medicine and surgery.
2. As a rule, preference will be given to researches on a single problem or on closely allied problems; it is hoped that investigators in this and in other countries may be found, whose work on similar or related problems may be assisted so that more rapid progress may be made possible.
3. Grants may be used for the purchase of apparatus and supplies that are needed for special investigations, and for the payment of unusual expenses incident to such investigations, including technical assistance, but not for providing apparatus or materials which are ordinarily a part of laboratory equipment. Stipends for the support of investigators will be granted only under exceptional circumstances.

In the past few years the policy outlined in paragraph 2 has been neglected and grants will be given in the sciences closely related to medicine without reference to special fields. Usually grants will not exceed $500, but in special instances grants may be up to $1000.

Applications for grants to be held during the year 1949-1950 must be in the hands of the Executive Committee before April 15, 1949. There are no formal application blanks, but letters asking for aid must state definitely the qualifications of the investigator, an accurate description of the research, the size of the grant requested and the specific use of the money to be expended. In their requests for aid, applicants should state whether or not they have approached other foundations for financial assistance and what other sources of support are relied on for research. It is highly desirable to include letters of recommendation from the directors of the departments in which the work is to be done. Only applicants complying with the above conditions will be considered.

Applications should be sent to Dr. Joseph C. Aub, Massachusetts General Hospital, Fruit Street, Boston 14, Massachusetts, United States of America.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Course for Diploma in Diagnostic Radiology.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that a course suitable for candidates for the diploma in diagnostic radiology will begin on March 21, 1949, for a period of twelve months. Unless candidates hold positions in the X-ray departments of hospitals approved under the diploma regulations, attendance at this course will be full time and post-graduates will be allocated to recognized metropolitan hospitals over the twelve months' period. Applications should be addressed to the Course Secretary, the Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney, from whom details of the course and copies of the diploma by-laws and regulations may be obtained. Telephones: BU 5238-BW 7483.

Obituary.

ELSIE JEAN DALYELL.

WE are indebted to Dr. Marjorie Little and Dr. Marie Hamilton for the following appreciation of the late Dr. Elsie Jean Dalyell.

Elsie Jean Dalyell graduated in medicine at the University of Sydney with first class honours in 1910 and was one of the first women appointed as a resident medical officer at the Royal Prince Alfred Hospital. In 1912 at the invitation of the late Professor Welsh she joined the staff of the department of pathology—the first woman to hold a teaching appointment in the faculty of medicine.

In 1913 she was awarded a Beit Research Fellowship and proceeded to the Lister Institute, which was to be her scientific home for many years. Shortly after the outbreak of the first World War she joined a voluntary hospital unit for work in Serbia, and later saw service in France, Malta, Greece and Constantinople. She was the first woman to be in charge of a laboratory with the Royal Army Medical Corps on active service and was awarded an O.B.E. for her work in this field. The organiatizon of a laboratory service under the almost impossible conditions which existed in the mountains of Greece and in Constantinople was a challenge which could only be accepted by one of Dr. Dalyell's skill, courage and resourcefulness, and her vivid descriptions of her experiences in these fields made a fascinating story when told in her inimitable style.

After the war Dr. Dalyell was invited to join a small group of scientific women selected by the Lister Insitute and the

Medical Research Council to study post-war nutritional diseases in Vienna, and from 1919 to 1922 she took part in the research which contributed so greatly to our knowledge of rickets and other deficiency diseases. She returned to Australia in 1923 and became attached to the microbiological laboratory at the Department of Health in Sydney in charge of serology. Convinced that close cooperation between laboratory and clinic was particularly important in the diagnosis and treatment of venereal disease, she accepted an invitation to develop the venereal diseases clinic at the Rachel Forster Hospital, and for six years devoted much of her characteristic thoroughness and enthusiasm to making this clinic the success it became. Many children of syphilitic parents in New South Wales owe their healthy lives to her skill and unfailing interest in their problems. She was also a member of the board of directors of the Rachel Forster Hospital for a period, and though her words were few at meetings they usually presented a judicial summing up of the problem under discussion.

Dr. Dalyell became a "centre" to which anxious and ambitious young graduates flocked for advice and guidance which were never withheld. Her constructive criticism was available to all who sought it, for in all her full and busy life she could always find time to be of service to others. The standard she set herself in all she undertook was perfection, and the quality of her laboratory work and her careful choice of the spoken and written word bore testimony to the successful application of such a standard. On the outbreak of the second World War Dr. Dalyell became one of the most regular bleeders of donors at the Red Cross Transfusion Service, giving her evenings and week-ends to serve in this field. This with the dispatching of countless food parcels to her many friends in England she undertook as her regular war effort.

These are the bare facts concerning the career of one of Australia's most brilliant medical graduates, but they tell little of the personal qualities which endeared her to a large circle of friends. The enthusiasm and untiring energy of her younger years were only equalled by the courage with which she endured many months of progressive ill health before the end. Elsie Dalyell was an inspiration to those privileged to call her friend and all so privileged realize how greatly her friendship enriched their lives.

Dr. Harriette Chick (London) writes: The news of the death of Dr. Elsie Jean Dalyell has been received with deep regret by the group of research workers at the Lister Institute with whom she was closely connected some years ago. The association began in 1913, during her tenure of a Beit Research Fellowship at that institute, but shortly after the outbreak of the first World War she temporarily abandoned research to join a voluntary unit organized for relief work in Serbia. In that country, in collaboration with Professor Hans Zinsser, of Harvard, she gave distinguished service in the fight, under almost impossible hospital conditions, against the great typhus epidemic. Later she worked in Greece as a pathologist in the Royal Army Medical Corps.

After the war Dr. Dalyell joined the small band of women who, on behalf of the Lister Institute and Medical Research Council, went to Vienna to study nutritional diseases. This small mission, armed with the new knowledge of the part played by vitamins in the experimental production and cure of deficiency diseases in animals, set out to investigate the ætiology of the rickets and other human nutritional disorders then prevalent in Central Europe as a consequence of wartime deprivations. For three years, from 1919 to 1922, Dr. Dalyell worked as the senior clinician in this unit, which succeeded in making a substantial contribution to our knowledge of the cause of these disorders, knowledge which has now become a commonplace. In the following year she returned to Australia.

Dr. Dalyell's former colleagues and other friends in England would wish to pay further tribute to her for her generous care of them during and following the recent war. A stream of parcels has arrived regularly to a large circle, and not only to her own contemporaries, but also to their children and grandchildren. These parcels, too numerous to be counted, bore evidence of much discrimination in the choice of contents: for the younger recipients a special emphasis on sweetmeats and for their elders a selection of nourishing foods to bring welcome variety into their family diet. Every ounce was considered on its own merit and a ball of precious knitting wool or a handful of almonds would be added to bring the weight up to the last fraction permitted by the postal authority. The packing of the parcels by Dr. Dalyell and her sister was in itself a work of art and, at the time of our greatest shortages, the fabrics in which the packages were meticulously sewn often provided welcome dusters and household cloths. These parcels were prized not only for their material benefit, great though this was, but also for the spiritual comfort they brought to us as messengers of love and friendship from the other side of the world in times of great anxiety.

The Royal Australasian College of Physicians.

Course in Advanced Medicine.

THE Victorian State Committee of the Royal Australasian College of Physicians has arranged a course in advanced medicine to be held at Prince Henry's Hospital, Melbourne, from February 22 to April 1, 1949, on Tuesdays, Thursdays and Fridays. On Tuesdays and Thursdays it is hoped to have patients available for examination from 1.30 p.m. to 2.15 p.m. This will be followed by a round of these patients from 2.15 p.m. to 3.30 p.m. From 4 p.m. to 4.50 p.m. there will be a lecture on a listed subject, and from 5 p.m. to 5.30 p.m. a demonstration of specimens, films *et cetera*. On Fridays there will be ward rounds commencing at 2.30 p.m. A detailed programme is available.

The course will be limited to sixteen students and a fee of £12 12s. will be charged. Applications to attend and inquiries should be addressed to Dr. J. Eric Clarke, c.o. The Royal Australasian College of Surgeons, Spring Street, Melbourne, C.1.

Sims Commonwealth Travelling Professor, 1949.

PROFESSOR G. W. PICKERING, Sims Commonwealth Travelling Professor for 1949, will deliver the following lectures in the Stawell Hall of the Royal Australasian College of Physicians, 145 Macquarie Street, Sydney, at 8.30 p.m.: Thursday, January 27, 1949: "Angina Pectoris and Intermittent Claudication"; Monday, March 7, 1949: "Headache"; Friday, March 11, 1949: "Peptic Ulcer". The lectures will be open to all members of the medical profession.

Australian Medical Board Proceedings.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Melick, Roger Aziz, M.B., 1947 (Univ. Sydney), Royal Hobart Hospital.

Flynn, Helen Beatrice, M.B., B.S., 1948 (Univ. Sydney), Launceston General Hospital.

Hardy, John Evans Simpson, M.B., B.S., 1945 (Univ. Adelaide), Smithton.

The following additional qualification has been registered:

Young, Aretas William Overton, D.P.H., 1947, Manchester.

QUEENSLAND.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Acts, 1939 to 1946*, of Queensland, as duly qualified medical practitioners:

Murray, Andrew Russell, M.B., B.S., 1946 (Univ. Melbourne), F.R.C.S., 1943 (Edinburgh), Alderley Avenue, Alderley, Brisbane.

Brown, Douglas Scott, M.B., B.S., 1947 (Univ. Sydney), General Hospital, Brisbane.

Maloney, John Bede, M.B., B.S., 1940 (Univ. Melbourne), c.o. Dr. A. J. Mooney, 245 Old Cleveland Road, Coorparoo, Brisbane.

Medical Practice.

THE BRITISH PHARMACOPŒIA IN QUEENSLAND.

A NOTICE has appeared in the *Queensland Government Gazette* of December 25, 1948, stating that in pursuance of the provisions of *The British Pharmacopœia Adopting Act*, 1898, "The British Pharmacopœia, 1948", shall have force in Queensland on and after January 1, 1949, and shall then be substituted for the British Pharmacopœia as published under the direction of the General Council of Medical Education and Registration of the United Kingdom in the year 1932, which is at present in force in the State of Queensland.

Corrigendum.

ATTENTION has been drawn to an error which appears in the article by Dr. R. S. W. Thomas, published in the issue of January 1, 1949. On page 10 in the first column the first sentence under the heading "Operation—Anæsthesia" should read: "Local anæsthesia was used; 0·5% procaine ("Novocain") solution with four minims of a 1 in 1000 adrenaline solution per ounce was employed."

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Gibson, William Carleton, registered under Section 17/2 of the *Medical Practitioners Act*, 1938-1939, c.o. the Department of Pathology, University of Sydney.

Newton, Helen Shackfield, M.B., B.S., 1948 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Notice.

A LECTURE on intracranial suppuration will be delivered at 5 o'clock p.m. on Tuesday, January 25, 1949, by Mr. Julian Taylor, of London, at the Stawell Hall, Royal Australasian College of Physicians, Macquarie Street, Sydney. The lecture is being given under the auspices of the Royal Australasian College of Surgeons. An invitation to attend is extended to all medical practitioners.

THOMAS BAKER MEMORIAL SCHOLARSHIP.

THE president of the Australian and New Zealand Association of Radiologists announces that the Thomas Baker Memorial Scholarship for Radiologists to the value of £1000 has been awarded to Dr. M. G. F. Donnan, of Perth, Western Australia. Dr. Donnan will spend a year in England furthering his studies in radiology.

Diary for the Month.

JAN. 26.—Victorian Branch, B.M.A.: Council Meeting.
JAN. 28.—Queensland Branch, B.M.A.: Council Meeting.
FEB. 1.—New South Wales Branch, B.M.A.: Organization and Science Committee (with representatives of Special Groups).
FEB. 2.—Western Australian Branch, B.M.A.: Council Meeting.
FEB. 2.—Victorian Branch, B.M.A.: Branch Meeting.
FEB. 3.—South Australian Branch, B.M.A.: Council Meeting.
FEB. 4.—Queensland Branch, B.M.A.: Branch Meeting.
FEB. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
FEB. 10.—Victorian Branch, B.M.A.: Organization Subcommittee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute; Brisbane City Council (Medical Officer of Health). Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £3 *per annum* within Australia and the British Commonwealth of Nations, and £4 10s. *per annum* within America and foreign countries, payable in advance.